Motivation and Reading Achievement: Understanding the Needs and Motivation Processes of Adult Literacy Learners

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Abstract

Adult struggling readers are understudied and most evidence-based remedial approaches target youth. This thesis examined relationships among motivation constructs across typical and struggling adult readers. Age was also investigated as a moderator in these relationships. Participants included 198 adults in adult basic education and 138 undergraduate students. Examining the influence of self-efficacy on reading achievement, moderation analyses indicated there were stronger relationships for typical readers. Furthermore, stronger relationships were found for younger participants when moderated by age. Additional regression analyses identified positive relationships between two measures of intrinsic motivation and reading value. This relationship was replicated for avoidance and value. Though age was not uniformly sampled across ability grouping, age did not account for these effects. Despite difficulties with reading, adults still exhibited motivation to engage with texts with equal to greater levels of reading value. Value and intrinsic motivation may have unique developmental courses associated with longstanding reading challenges.

Keywords: adult literacy, adults with low literacy skill, intrinsic motivation, self-efficacy reading value

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Table of Contents

List of Tables

List of Figures

List of Appendices

Introduction

Many adults have difficulty reading basic texts they encounter in their daily lives (Kutner et al., 2007; Statistics Canada and the Organization for Economic Cooperation and Development, 2005). Struggling readers often avoid engaging with texts; which in turn has been associated with missed opportunities to practice and improve their reading ability (Roberts, Torgesen, Boardman & Scammacca, 2008). These behaviours pose difficulties for negotiating a text-based society. A critical area in research pertaining to learning and reading is the relationship between motivation and achievement, especially among individuals with reading difficulties. When individuals are motivated to read they are more likely to remain interested and engage with texts, as well as attempt to understand and extract meaning from what they read (Roberts et al., 2008). A large body of research has described the relationship between motivation and achievement, but the nature of this relationship remains unclear (Guthrie et al., 2007; Wang & Guthrie, 2004). With literature on adult struggling readers being scarce, the current study addresses this gap by exploring the nature of this relationship among adults who struggle with reading.

This work integrated and extended a larger five-year project focusing on instructional approaches for the cognitive and motivational needs of adults who struggle with reading. The unique needs of adult literacy learners are understudied as most current evidence-based remedial approaches are based on a younger population (Greenberg et al., 2011). The current study focused on Phase 1 of this larger study, which examined underlying cognitive and motivational processes associated with or influencing the reading development of adults who struggle with reading. The larger study aimed to develop and evaluate an instructional reading program for adults who read between grade

three and grade eight levels. Thus, to further support the design of developmentally appropriate literacy interventions, the current study examined the motivational processes of adult learners in relation to reading and component skills. Specifically, this work analyzed results from self-report measures across various motivational constructs. The extent to which these constructs and reading fluency sub-skills influence one another was explored. The current study extended the larger study by collecting data from a second recruitment sample of undergraduate students. This enabled extension of the investigation beyond a population of struggling readers to a population of typically developing learners. This work aimed to provide a better understanding of the motivational processes of adults with a range in age, as well as achievement. Using these two samples together can bridge current gaps in the literature on the motivation-reading relationship and adult literacy populations, and also aid in the development of literacy intervention programming that meets the unique and complex needs of adult learners.

Literature Review

Adult Learner Population: A Need for Further Research

Many individuals continue to experience difficulties with reading beyond childhood and adolescence and well into adulthood (Kutner, et al., 2007; Statistics Canada and the Organization for Economic Cooperation and Development, 2005). Evidence based practice on reading remediation is growing in the literature, although much of what is known in the study of reading focuses on children and adolescents. Also, due to the use of convenience sampling, reading literature has often focused on Caucasian populations of middle to higher socio-economic status (Cox & Yang, 2012). Meanwhile studies on adult literacy programs have found that this population of learners is quite

diverse, representing multi-lingual individuals with a range in ability, age, gender, and cultural background (Greenberg et al., 2013). Still however, the adult population is understudied, especially in regards to their cognitive and motivational needs (Greenberg et al., 2011). While literature on both adult literacy and motivation are gaining some attention again within research on struggling readers, they are still not among the most popular topics in reading research (Cassidy & Grote-Garcia, 2014). However, this does not at all take away from the importance of this work, rather it further supports its necessity.

Achievement is heavily dependent on reading competence as text-based materials are most highly used in a range of learning contexts. During the transition from learning to read to reading to learn, students who have not yet grasped basic literacy skills will start to fall farther behind in the subsequent years. Students who gain skills at developmentally appropriate points will experience the reward of reading experiences, leading them to greater engagement with text and further acquisition of skill. This has been named in the literature as the *Matthew Effect* (Stanovich, 1986). If individuals leave schooling with low reading abilities or without basic literacy skills they will continue to have difficulty engaging with text in their everyday lives. However some adults have chosen to seek out continuing education programs to help improve their literacy skills. Qualitative findings from Duncan (2009) indicated that adult literacy learners perceived reading as being important in many different ways ranging from an important skill that helped them acquire their goals, such as employment, to an activity that they could engage in with their children. Thus reading value, despite simultaneous struggle with reading, can lead to a demonstration of persistence and motivation to continue engaging

with texts. This persistence, despite reading difficulties, suggests that the value of reading may play a critical role in possible developmental differences in motivation for struggling readers. Also emphasized is the importance of developing reading remediation programs that consider and target the motivational needs and interests of an adult population, given that their motives and aspirations socially and developmentally are quite complex relative to a youth population.

For instance, typical environments associated with the adult learner population are post-secondary and continuing education institutions. Given the competitive nature of post-secondary institutions it would be expected that learners would demonstrate eagerness to perform well. Furthermore, with a heightened emphasis on grades, performance based motives may be further evident. Marsh and his colleagues (2003) argued that performance motives aim to seek positive reward or avoid negative situations such as failure. With age there are increased societal pressures to perform well in educational contexts and in turn seek out employment opportunities. Thus, suggesting changes and more specifically heightened motivational processes within this population. The added employment element furthermore adds to the complex nature of adult achievement-motivation. Post-secondary education is not the only prominent force guiding achievement motivation for adults. Some individuals may seek out opportunities that focus on specific upgrading skills in order to attain promotions or a desired opportunity (Ahl, 2006). Such upgrading programs may simply cater to new or growing interests both professional and recreational. These motivational processes may be better understood by learning motivation factors (Marsh et al., 2003) as individuals have internally driven rationales for seeking to improve their literacy skills. With greater

complexity in individual goals it is hypothesized that motivational processes would then in turn be influenced developmentally.

Developmental Trends in Motivation: The 'Triadic Neural Systems Model'

With literature on the motivational and cognitive needs of adult literacy learners being scarce (Greenberg et al., 2011), researchers must look to other disciplines for support. For instance, brain maturation has been discussed in previous research in relation to multiple factors of achievement, including reading and motivation. Some research has paid close attention to behaviour patterns with brain development, some of which include aspects of motivation. Ernst (2014) has recently reviewed the notion that neural pathways and brain maturation occur along critical developmental timelines, which impact patterns of behavioural development, some of which may be associated with motivational dispositions. Furthermore, over time, neural connections in the brain become more refined, which is associated with improved cognitive functioning in regards to retrieval and processing of information (Ernst, 2014; Nagy, Westerberg & Klingberg, 2004). Ernst has proposed that a 'triadic neural systems model' can be applied to the study of motivation; this model encompasses aspects of both brain development and constructs of motivation. Specifically, the 'triadic neural systems model' attributes determinants of motivation to three domains of the brain: the prefrontal cortex, striatum, and the amygdala. The model is made up of three components, cognitive impulsivity associated with the motivation and reward system, emotions associated with the amygdala, and regulation associated with the prefrontal cortex (Ernst, 2014).

Within this model, motivation is closely linked with the dopaminergic mesolimbic system, which is associated with rewards and positive emotions. Accordingly, in

behavioural research motivation has often been associated with positive and negative rewards (Bandura, 1961). Motivation is linked with the striatal system given its responsiveness to rewards; and is also then related to habitual behaviour given the history of previous rewards (Ernst, 2014; Wise, 2004). Developmentally, this system can be described as following a curvilinear pattern as it appears to be more active in adolescence as sensitivity to rewards peaks; however, in negative contexts when anticipating reward this system is not as responsive in adolescence as it is in adulthood (Bjork, Smith, Chen & Hommer, 2010; Ernst, 2014). Perhaps less cognitive impulsivity after adolescence is associated with the ability to respond to long-term, rather than immediate, rewards. Thus, in relation to reading, adults who may have once disengaged with reading due to consistent difficulties may later leverage the long-term benefits or goals associated with greater literacy skills to re-engage with text and reading.

The triadic model explains positive emotions in relation to approach behaviours, and negative emotions to avoidance behaviours (Ernst, 2014). Given the outcome of a learning experience, success or failure, either positive or negative emotions can develop. Success is a rewarding experience often associated with greater competency, which is reinforcing, while failure may lead to a feeling of helplessness and, in turn, avoidance (Aarnoutse & Schellings, 2003; Aunola, Leskinen, Onatsu-Arvilommi & Nurmi, 2002; Chan, 1994; Chapman, et al., 2000; Morgan, Fuchs, Compton, Cordray & Fuchs, 2008). Emotional functions also follow a curvilinear pattern with emotion-based brain systems, including the amygdala, being more active in adolescence for positive contexts, however less active in negative contexts for adolescents as compared to adults (Ernst, 2014).

Literature on the developmental course and trajectories of motivation typically

focus on periods of childhood and adolescence, however the consistency of cognitive and motivational processes in adulthood is understudied (Greenberg et al., 2011). Thus, it is unclear whether or not the interrelationship or even the constructs of motivation change or remain stable beyond adolescence. Understanding the developmental pathway of cognitive and motivational constructs can help inform reading literature. Furthermore, understanding maturational differences from childhood to adolescence and well into adulthood can additionally support the development of reading interventions and the ability to address a range of not only reading abilities but also age effect differences.

Unpacking Motivation

Past research with children has provided evidence that motivation for reading is multidimensional (Guthrie et al., 2007; Marsh et al., 2003; Schiefele, Schaffner, Moller & Wigfield, 2012). Due to the complex and abstract nature of motivation, major concerns for research in this area are the difficulty in assessing components of motivation perceptions and behaviour, and also in defining such constructs (Da Costa & Remedios, 2012). Across the field there appears to be some inconsistency in the identification of specific traits of motivation and, furthermore, their relationship to one another in the context of learning (Schiefele et al.; Conradi, Jang, McKenna, 2014). However, a unified theory of motivation is continuing to be developed (Marsh et al., 2003). Thus, the first step in motivation research must be to review a range of both theories and empirical findings of various motivation constructs and their interrelationships.

Theories of motivation. Motivation has been examined in many different ways ranging from theories of brain development to the study of personal experiences. This diverse range in perspectives can lead to issues of clarity in understanding the specific

role of motivation in the context of learning. However, reviewing a history of motivation research provides insight to a general understanding of the important role of motivation in human behaviour and development.

Theories regarding behaviour motivation have been well established; specifically Thorndike's (1911) *Law of Effect* stating that behaviours which have been previously rewarded are more likely to be repeated, while those that were punished may be avoided or extinguished (Weiner, 2010). This fundamental theory highlights the importance of previous experiences in understanding human behaviour. Later, the importance of individual attributions became of interest. Attribution theory, initially proposed by Dr. Fritz Heider and further developed by theorists such as Dr. Bernard Weiner, focused greatly on the causes and reasons individuals associate with the occurrence of events (Weiner, 1985).

Accordingly, Rotter (1966) established the concept of "locus of control" which added the component of the perception of personal control of specific outcomes, such as success and failure in learning. External locus of control, such as the perception that events occur because of luck, is identified as something outside of individual attributes, while internal locus of control is very much attributable to personal traits, such as skill or effort (Rotter, 1966). Motivation research then began to investigate potential profiles based on such perceptions. For instance, the internal locus of control profile, where individuals feel they have control over their learning outcomes (i.e., "I succeeded because I am skilled and I worked hard", or "I failed because I did not try my best"), is associated with more adaptability than is the external locus of control profile of those who feel that they have less control (i.e. I succeeded because I was lucky or I failed because the teacher

does not like me) (Wigfield, 1988). The latter motivational profiles, which suggest an individual feels they have little to no control over their learning outcomes, have been associated with a sense of learned helplessness (Chan, 1994; Stanovich 1986).

Attribution theories highlight the importance of considering individual self-perceptions and rationales associated with past learning experiences (Weiner 1985; Weiner, 2010) when striving to understand motivational processes of struggling readers. Expectancy-value theory states that an individual's choice, persistence and performance are associated with how much they value a task and how well they expect to perform (Wigfield & Eccles, 2000). Furthermore, efficacy expectancies, in addition to outcome expectations, are equally powerful in predicting performance and choice (Bandura, 1997; Wigfield & Eccles, 2000). Thus, both the beliefs an individual holds regarding their own competencies as well as the perceived value of a given task are critical to task engagement.

Motivation research has a complex history with diverse standpoints. The contribution of multiple theoretical perspectives could aid in providing some clarity regarding potential motivation profiles in the context of reading. Attribution theory may insinuate potential adaptive vs. maladaptive learned helplessness profiles given the influence of previous achievement outcomes on an individual's motivation to engage with texts. Some literature has suggested that repeated failure outcomes are associated not only with text avoidance, but also with a sense of helplessness (Aarnoutse & Schellings, 2003; Aunola, et al., 2002; Chan, 1994; Chapman et al., 2000; Morgan et al., 2008). However, Rotter's (1966) concept of "locus of control" as well as expectancy value theories (Wigfield & Eccles, 2000) may further indicate that perceived outcomes are

equally, and perhaps sometimes more, predictive of achievement. For instance Wolters, Denton, York and Francis (2012) found that motivational beliefs and perceived control predicted reading comprehension performance among adolescent students. Thus, if an individual feels they have internal control of their achievement, expects to perform well, or values a task, they may demonstrate more positive self-concept and potentially greater effort which could, in turn, contribute to academic gains (Eccles, Wigfield & Schiefele, 1998; Jacobs, Lanza, Osgood, Eccles & Wigfield, 2002; Schiefele et al., 2012). Reasoning behind the choices and degree of task engagement exhibited by individuals is better understood through the combined efforts of multiple motivation theories (Wigfield & Eccles, 2000).

Together these diverse perspectives contribute to the developing 'grand theory of motivation' (Weiner, 2010). There is however a need for greater theoretically driven research in the area of achievement motivation to provide better clarity and consistency across studies (Marsh, Craven, Hinkley & Debus, 2003), particularly regarding how to conceptualize motivation. Each standpoint provides vital insight into the complexities of the motivation-reading relationship and continues to inform studies in the field.

Construct Confusion. In addition to diverse theoretical perspectives, an ongoing concern in reading research is whether constructs of motivation are being examined accurately. Marsh and colleagues (2003) have discussed complexities associated with defining motivation constructs with what is referred to as the 'jingle-jangle fallacy'. The 'jingle fallacy' highlights that while some scales claim to assess one motivation construct, due to similar construct names across measures, they may in fact be assessing another. While the 'jangle-fallacy' cautions that while multiple scales with differing construct

names may appear to measure different motivation types, in fact they may examine the same subtype (Marsh et al., 2003). Schiefele et al. (2012) conducted a review summarizing findings on the motivation-reading relationship to identify different dimensions and relations among motivation constructs. Their extensive review provided a better understanding of what constructs have been evaluated and how they compare with one another across multiple studies. Such work aids in the identification of subgroups of motivation constructs. However, their review argued that several questions still remain regarding the conceptualization of reading motivation and behaviour.

Furthermore, beyond construct definitions, motivation in the context of adult education remains an entirely different and unexplored domain. Ahl (2006) argues that motivation is more relational rather than a construct of individual dispositions. Ahl (2006) further discusses how motivation for adult learners is primarily focused on recruitment and sustainability of continuing education. Thus, it is suggested that the complexities of motivation lie not only within individual characteristics, but also in the relational dimensions of instruction and learning (Ahl, 2006). For instance, education can be seen as a platform for primary motives. One's value of education itself may not be a driving force on its own, rather motivation for the adult learner may be better conceptualized as the relationship between two entities or a means to an end. The connection between learning and employment makes up the drive to read; education improves reading skill, which helps to obtain a job. Such findings support previously stated assumptions regarding less impulsivity and greater responsiveness to long-term goals (Ernst, 2014). The factors that constitute 'motivation' are still being debated, however multiple dimensions or theories of motivation have some ground in establishing

a better understanding of how to identify this drive in achievement.

Considering the context of learning and reading, various theoretical standpoints pose critical suggestions for how motivation and achievement influence one another; however further clarity is still needed to unpack this relationship. Some progress has been made in identifying overlapping constructs to better understand specific dimensions of motivation. For instance, Marsh et al. (2003) proposed the Big-Two-Factor Theory of Academic Motivation Orientations arguing for the presence of two motivation factors, Performance and Learning. The Performance factor is driven by social comparisons to obtain success or avoid failure seeking positive rewards and avoiding negative judgements. Performance motivation is driven more by external evaluations of oneself for greater gain or as a means to an end (Marsh et al., 2003). Conversely, the Learning factor is associated with a desire for increased competency and mastering of tasks. Learning motivation is centred on internal values and aspiration of greater competency as a goal itself (Marsh et al., 2003). Thus suggesting those who are internally driven versus those who may be more externally or socially driven. Research on the Big-Two-Factor Theory established each factor level by examining correlations among constructs. Constructs identified with a Learning orientation were all highly, and mostly positively correlated; and similar results were found for constructs within the Performance orientation (Marsh et al., 2003). Furthermore, constructs across the Learning and Performance factors were less correlated with one another (Marsh et al., 2013). The present study examined both constructs of performance and learning factors to evaluate the motivation-reading relationship among different subtypes. The Big-Two-Factor Theory does not encompass all motivation constructs; rather it suggests that a selection of overlapping constructs

could be examined together under either Learning or Performance orientations.

The way constructs of motivation are defined has implications for how they must be measured (Da Costa & Remedios, 2012) which emphasizes the need for further research examining how different subtypes of motivation interact with one another. Subtypes that appear to be different may actually be representative of the same underlying construct. Such cautions argue for the importance of not only investigating current relationships between motivation constructs in the context of learning, but also the criticality of seeking to replicate such work. Replication of results with a range of constructs may provide clarity across motivation subtypes. Thus, the present study sought to utilize an overlap in motivation subtypes across measures in order to better understand the nature of particular motivation subtypes; specifically the implications of learning versus performance motivation in the context of reading.

Motivation in the Realm of Reading

Literature on the motivational dynamics of struggling adult readers is limited; however, motivation as a general theme is becoming more apparent in reading research, examining both direct and indirect relationships between motivations and reading skills (Guthrie, Lutz Klauda & Ho, 2013). Furthermore, in these studies literacy interventions are showing a greater interest in incorporating motivational components in remediation and educational programming to assist learners' engagement and, in turn, performance (Quirk & Schwanenflugel, 2004). However, the nature of the motivation-achievement relationship still remains unclear due to varied results (Guthrie, et al., 2007). Also, there has been greater focus on general correlational findings rather than on causal or directional relations (Schiefele et al., 2012). However, vast correlational studies with

strong mixed results between motivation and achievement suggest a multifaceted bi-directional relationship, meaning that reading achievement and motivation influence one another (Guthrie et al., 2007; Morgan et al., 2008; Morgan & Fuchs, 2007).

The motivation-reading achievement relationship. Some research has demonstrated results arguing that motivation may be a predictor for later reading achievement. For instance, Quirk, Schwanenflugel and Webb (2009) found that at each time point in their study self-concept was predictive of reading fluency. Motivation constructs, such as self-efficacy, have also been shown to influence reading components skills such as reading comprehension (Guthrie et al., 2007; Proctor, Daley, Louick, Leider & Gardner, 2014) as well as the use of learning strategies (Sadi, 2013). Similarly, expectancies and value have both been shown to be predictors of strategy use, which in turn demonstrated influence on grades (Pokay & Blumenfeld, 1990). Accordingly, intrinsic and extrinsic motivation have demonstrated significant contributions to reading amount (Guthrie, Wigfield, Metsala, & Cox, 1999; Wigfield & Guthrie, 1997).

The degree of motivation to engage with texts is thus influential on performance, however previous research has also displayed evidence indicating that reading skills and achievement growth are predictive of motivation. Diseth (2011) found that initial academic achievement was predictive of self-efficacy and in turn later achievement. Also, while unrelated to reading, but still important to note, Gottfried, Marcoulides, Gottfried, Oliver and Guerin (2007) found bidirectional relationships between math achievement and intrinsic mathematics motivation; demonstrating positive relationships between both initial achievement and motivation and vice versa. Similarly, Viljaranta, Lerkkanen, Poikkeus, Aunola and Nurmi (2009) found that children, as young as five and six years

old, who demonstrated greater levels of arithmetic performance also showed greater interest in mathematics later on. In addition to general achievement scores, the past learning experiences individuals have has also been shown to have some influence on various motivational factors. While interest, whether internally or externally driven, promotes engagement with texts, much research has been done to suggest the critical influence of performance outcomes on motivation. For instance, Stanovich (1986) conducted an in-depth review of individual differences and the well-known *Matthew Effect.* His review discussed how whether a person experienced success or failure on a given task they were either more or less likely to engage with it later on, similar to behavioural theories based on reward and punishment systems (Bandura, 1961; Thorndike, 1911). Both success and failure performances have been associated with motivation. Furthermore, attribution retraining has now been seen in academic remediation programming to promote greater self-esteem via controlling learning outcomes in an adaptive way (Toland & Boyle, 2008).

With a wide range of measurement, some studies have reported stronger causal relations than others (Morgan et al., 2008) depending on population and design, but also due to choices pertaining to which measures of both reading skill and motivation have been implemented. Overall, such findings demonstrate the multifaceted nature of the relationship between motivation and reading achievement.

Motivation among individuals with learning difficulties One of the contributing factors when exploring the relationship between motivation to engage with texts and overall reading performance is whether or not a disability is present. The importance of past learning experiences in relation to motivation was discussed previously; this is

especially relevant among a population of individuals with learning difficulties. As such, there is growing evidence to suggest an especially important relationship between motivation and achievement among a population of individuals with or at-risk for disabilities (Lee & Zentall, 2012; Logan, Medford & Hughes, 2011). Group differences in motivation have been found between students who have previously struggled with reading in comparison to typically developing readers (Wolters, et al., 2012). Students with reading disabilities have demonstrated lower levels of intrinsic motivation and extrinsic motivation, as well as self-efficacy in comparison to their typically developing peers (Lee & Zentall, 2012). There also appears to be a tendency for students with learning difficulties to report more negatively on measures of self-concept, anxiety and locus of control (Prout, Marcal & Marcal, 1992). Similarly, in comparison to typically developing peers, students with learning difficulties are more likely to demonstrate lower self-esteem and maladaptive attribution profiles including characteristics such as less persistence, low achievement expectations and negative academic self-concept (Chan, 1994; Morgan et al., 2008; Nunez et al., 2005; Valas, 2001). Such findings suggest a sense of learned helplessness due to repeated failure or struggles among lower achievers (Chan, 1994). However not all students with reading difficulties develop poor motivation to engage with texts or negative self-perceptions associated with learned helplessness (Kistner, Osborne & LeVerrier, 1988; Nunez et al., 2005). Therefore, it is still unclear how motivation differs based on the presence of a disability. There may perhaps be greater differences among learning experiences in combination with individual dispositions that leave some more at-risk for negative or low motivation to learn, and more specifically to engage with texts. This may in turn become more complex when

considering which factors influence the motivation of adults enrolled in continuing education programs who at an earlier time may have disengaged with learning, and more specifically reading, due to difficulties.

Interplay between motivational constructs. While both reading achievement and motivation have demonstrated complex relationships with one another, various constructs of motivation and different reading sub-skills have demonstrated bi-directional roles in the motivation-reading relationship. Reading skill and earlier achievement have consistently been associated with later performance (Morgan & Fuchs, 2007; Schiefele et al., 2012). However, more interestingly, some motivation constructs have demonstrated similar relationships with other motivation types such as self-efficacy and reading value (Al-Harthy, 2010; Keskin, 2014). Additionally, while Sadi (2013) found that self-efficacy was predictive of strategy use, they also found that self-efficacy predicted self-regulated learning and strategies that promoted persistence during difficult tasks. Mediating roles within the motivating-reading achievement relationship have demonstrated further complexities regarding directionality. For example, reading amount has shown to act as a mediator in the relationship between intrinsic and extrinsic reading motivation and reading competence (Becker, McElvany & Kortenbruck, 2010; Schaffner, Schiefele & Ukferts, 2013). Other research has demonstrated the mediating roles of motivation constructs such as self-competencies (Eccles et al., 1998) and self-efficacy (Diseth, 2011) in the reading-motivation relationship. Keskin (2014) found that metacognitive awareness of reading strategies was significantly predictive of self-efficacy and that, in turn, self-efficacy was a predictor of task value.

Thus, in addition to the bi-directional relationship between motivation and achievement, various subtypes of motivation can also be predictive of one another (Keskin, 2014; Schaffner et al., 2013; Schiefele et al., 2012). The nature of reading-motivation may be better understood by exploring multiple relationships between individual constructs of motivation in addition to performance and ability alone. Therefore, the current study not only investigated the relationship between reading achievement and motivation, but also how different constructs of motivation related to one another as well as across ability and age groupings. Collectively, the literature examining the network of relations between reading achievement and motivation has covered a range of constructs however what still remains unclear is how such constructs interact with one another for adult learners, especially among those who struggle with reading.

Current Study

Rationale

Literature on adults who have difficulty reading in relation to their learning needs, educational programming, and personal experiences is scarce (Calhoon, et al., 2013; Greenberg, et al., 2011). However, there is evidence that there is a significant number of adults who read below a typical high school level and who, in turn, have difficulty engaging with everyday texts (International Adult Literacy Survey, 2011; Statistics Canada and the Organization for Economic Cooperation and Development, 2005). Such individuals are considered to be at-risk for further educational and occupational difficulties, such as in higher education and future employment. This can become more globally problematic in terms of costs that reflect the impact of low literacy skills on

health expenditures, crime rates, lower work place productivity and low tax revenue due to greater unemployment (Greenberg et al., 2011; Vernon, Trujillo, Rosenbaum, & DeBuono, 2007).

Furthermore, there is little evidence of responsiveness to remediation programs for adult literacy learners (Calhoon, et al., 2013). It is suggested that a lack of significant gains for adults is related to the absence of a critical investigation of the role of educational histories and personal experiences (Calhoon, et al., 2013). This gap in the literature suggests the need for future research to evaluate reading beyond the focus on achievement. The lives of adults are quite complex, thus there is the need to consider individual dimensions and experiences of the learners themselves in addition to developmentally based research. Additionally, the lack of significant results indicating a response to intervention for adult learners could also be associated with the fact that many remediation programs and previous studies are based on child and adolescent populations (Calhoon et al., 2013; Greenberg et al., 2011; Nanda et al., 2010). Nanda et al. (2010) conducted an intensive analysis on whether or not child-based models in literacy development can be applied to adults who struggle with reading and found that there were many issues in trying to adopt child-based models for an adult population.

While the adult learner population in basic literacy education often reads at or even below the grade level of adolescents, their needs, interests and other individual dispositions are much different. Such findings suggest the criticality and need for research that explores the specific needs of adult learners in order to develop remediation programs that have targeted adult-based strategies, as opposed to the vast majority that are based on younger populations. Thus, the larger Centre for the Study of Adult Literacy

(CSAL) work aims to develop literacy programming that is suited to the cognitive and motivational needs of adult struggling readers. To extend this work the current study specifically adopted an overall focus on gaining a better understanding of the motivational traits of the targeted adult learner population. Motivation has demonstrated a critical role in literacy research (Schiefele et al., 2012); however, as discussed, adult reading motivation is understudied. This study sought to further investigate the nature of previously studied motivation-reading achievement relationships by examining the connections between various constructs of motivation in relation to reading fluency skill; however with a focus on adult learners. Finally, to add to the field of motivation research for disability populations, the current study also sought to examine differences in struggling and typical readers with the addition of another recruitment sample of university students. The current work moved beyond an age focus to investigate the role of ability in the motivation-reading achievement relationship. Such analyses aimed to improve the understanding of motivational processes of adult learners in order to better support their unique learning needs.

Research Questions

The current study investigated the nature of the relationship between constructs of motivation and reading achievement among adults who struggle with reading. Previous literature, especially qualitative studies (Duncan, 2009), have demonstrated a desire for reading skill among adults who have difficulty engaging with texts, despite their discomfort or feelings of struggle. Such findings argue for an internal value of reading despite a history of reading difficulties and perhaps even failure. Thus, to examine learning motivation in an adult population the present study evaluated the extent to which

interest or willingness to engage with reading was associated with reading value. Furthermore, literature on self-efficacy has demonstrated strong positive relationships with reading achievement (Guthrie et al., 2007; Proctor et al., & Sadi, 2013**)**. Self-efficacy is concerned with internal perceptions of competency and outcome expectancies (Wigfield & Eccles, 2000) which are classically associated with performance motivation (Marsh et al., 2003). Motivation constructs such as intrinsic motivation as well as self-efficacy have demonstrated differing relationships with reading achievement across ability populations (Lee & Zentall, 2012). To extend these themes to an adult population, and furthermore a disability population both learning and performance factor constructs were explored across ability and age groupings.

Regression analyses examining this relationship compared data from two samples of adult learners; one consisting of undergraduate university students and the other being a selection of adults from adult basic education programs in both Canada and the United States from communities in the Greater Toronto Area (GTA) and Atlanta, Georgia. The latter sample was derived from the larger Center for the Study of Adult Reading study sample. The current study's samples represented differences in age as well as achievement to further examine the nature of this relationship across age and ability groupings. Due to a lack of literature on the needs of struggling adult readers (Greenberg et al., 2011) each analysis considered theories as well as previous findings from research with children and adolescents. This assisted in gaining a better understanding of the relationships between motivation and reading achievement variables while also exploring the stability of such relationships. Therefore, the roles of both age as well as ability were explored when investigating the motivation-reading achievement relationship. The

following research questions were investigated to explore the reading achievement-motivation relationship among adult literacy learners:

1. What are the motivational characteristics of adult learners?
    a. Specifically how do motivational constructs compare across individual characteristics such as sex, race and language status?
2. Performance Motivation Factors: What is the nature of the relationship between self-efficacy and reading fluency in a population of adults who have complex histories and experiences with reading? Furthermore, how do reading ability and age influence this relationship?
    a. Is this relationship stronger for struggling readers in comparison to typical readers?
    b. Does age moderate this motivation-reading achievement relationship?
3. Learning Motivation Factors: What interplay is there among motivation constructs in an adult population?
    a. Despite experiencing difficulties in literacy, adults who have struggled with reading still demonstrate motivation to engage with reading (Duncan, 2009). How do the relationships among motivation constructs differ for adult struggling readers and typical readers?
        i. What is the role of age versus ability in regards to reading motivation?

Method

Recruitment Sample 1: Centre for the Study of Adult Literacy (CSAL)

Participants. The first sample included individuals from a larger multi-site CSAL study. These participants in sample 1 were recruited from the GTA and nearby surrounding municipalities in Canada; as well as Atlanta Georgia, USA. Inclusion criteria targeted participants who had a reading achievement level falling within the third to eighth grade level. Screening to assess for targeted reading level was done using the school board's assessments of students when they enter the adult education programs. Inclusion criteria were not limited by either developmental disability or language status. If participants were representative of either an English as a second language or disability population, it was critical to ensure that participants had both the language and cognitive level necessary for providing informed consent, as well as having the ability to comprehend each of the research activities. Furthermore, for ESL learners' inclusion criteria stated that they must be within the grade three to grade eight reading level with regards to English only, not necessarily their first language.

Study Design and Procedure. The target sample size for the larger study was approximately 500 adults in literacy and basic skills (LBS) and adult basic education (ABE) programs. The present study used only a portion of this sample, as recruitment for the larger study was ongoing. Participants were recruited through community partnerships. Specifically, the research partnered with adult continuing education programs through various school boards as well as some independent ABE organizations. Members of the research team visited classroom locations where they provided a brief introduction to the research study. Students who were interested in participating and who

fell within the required reading achievement range were then approached one-on-one to continue the recruitment process, including gaining informed consent. All participants were presented with a formal copy of the written consent, however members of the research team presented each component of the consent verbally and in plain language, as per Tri-Council ethical standards. Any questions raised during the process were addressed immediately during the initial recruitment and consent. If any questions arose later on there were opportunities to address those as well. Once consent was gained one-on-one testing sessions between a trained member of the research team and the participant commenced. In total there were 37 activities, ranging from reading activities of various literacy skills (i.e. comprehension, fluency, phonics etc.), to questionnaires and two interview questions at the end. Testing sessions collectively took approximately four to six hours in total. However, this was done over a series of smaller sessions with duration dependent on the learner's availability. The total time an individual worked with our team was recorded and following the completion of their participation in our study they were paid $10.25 for each hour of work as a thank you for their time and effort since no program or other form of compensation was available to them at the time.

Recruitment Sample 2: Brock University

Participants. Participants in sample two were recruited from Brock University in St. Catharines, Ontario. Recruitment was completed in partnership with Brock University's Student Development Centre and Learning Services. Participants were undergraduate students who were registered in either the BOOST or STEP program. Participants were presented with an opportunity to take part in the proposed research during one of their class sessions. The two programs are similar in structure as they each focus on

developing critical skills for post-secondary studies. Each program follows a seminar style format and addresses skills pertaining to time management, studying and exam preparation, academic writing, critical thinking and overall academic responsibilities. However, the programs differ in their target audiences. The STEP program is geared towards students who received a conditional offer of acceptance from the university; however after this acceptance their high school average decreased below the required limit for program admission. The BOOST program is offered as an alternative to academic suspension. Both STEP and BOOST are non-credit programs consisting of fifteen 90-minute sessions. The second sample represents a population of typically developing learners. While students enrolled in both the BOOST and STEP programs typically represent a lower achieving group of learners in comparison with the larger university population, this sample consists of a typically developing group of young adults and provided data for a comparison group for sample one.

Study Design and Procedure. Students in the BOOST and STEP programs were given an opportunity to take part in the research during one of their regular class sessions. Their participation involved one hour of their time during which they completed a series of reading activities and questionnaires. During the one-hour session two research investigators visited the class to explain the research project and to invite students to participate. All students in each session were given two packages: Part A and Part B. Part A was composed of the research study activities while Part B was a compilation of reading and exam strategies that students would have been previously working on in their BOOST and STEP classes. After an introduction of the research opportunity students were given the option to choose either Part A or Part B. This allowed students to choose

whether or not they wished to participate in the research in a private manner. At this point those who were interested in participating in the research were taken through the consent process. Consent was presented orally to the whole class. Once consent was obtained, group administration of all reading activities and questionnaires began. The visiting investigators provided standardized instructions for all steps of the study, providing opportunities for questions throughout. At the end of the study all participants were thanked and if they wished they were able to additionally sign up for the opportunity to receive a motivational profile developed by the research team. The motivation profile provided details on their strengths and challenges which were derived from the activities they completed during the study.

Measures

The larger study included a total of 37 activities consisting of a range of reading activities, questionnaires, and an affective interview session. For the purposes of the research only a subset of the larger total of 37 were used. This decision was made for reasons of measurement consistency between Study 1 and Study 2.

Demographics. A demographics questionnaire was used that was composed of 72 items asking questions pertaining to age, gender, race, country of birth, English language status and educational history. However, participants were never asked all 72 items, rather some questions directed examiners to specific items skipping others depending on a participant's response. For example, if an individual had not graduated high school or completed any general educational development (GED) courses, then questions regarding such information were skipped. Sample two used a shorter version of the demographics questionnaire. Of the original 72 items only 12 questions were used.

This allowed researchers to collect data for the second sample within a single visit which was critical as participants in this sample were enrolled in classes for only one academic term.

Reading Achievement. Three measures of reading achievement were used: the Woodcock Johnson (WJ): Reading Fluency, the Test of Silent Word Reading Fluency (TOSWRF), and the Test of Silent Contextual Reading Fluency (TOSCRF). All measures examine reading fluency, which is a critical pre-skill for comprehension. A fluent reader can more easily recognize words as they read which allows them to focus more energy on drawing information and meaning from a text as opposed to decoding each individual word (Greenberg et al., 2011; Nathan & Stanovich, 1991; Perfetti & Hart, 2002). Each measure is a timed-task that assesses a form of reading fluency. Following standardized examiner instructions, each measure involved a brief amount of practice to ensure individuals understood the objectives and how to complete the tests before the timer started and the actual assessment occurred.

The WJ Reading Fluency is a subtest of the Woodcock Johnson-3 (WJ-III) Tests of Achievement that assesses connected text fluency. This subtest is a timed task where individuals are asked to read simple sentences and then indicate whether or not the statement is true by circling either “yes” or “no”. The level of difficulty increases gradually to a moderate level. Individuals were given exactly three minutes to complete as many items as possible. The WJ Reading Fluency subtest has a median reliability of .90 in the adult range (Woodcock, McGrew & Mather, 2001).

The TOSWRF is another timed task that assesses silent word reading fluency. A total of three minutes was given for this assessment. Participants were presented with

rows of words that are run together, meaning there are no spaces between words. Individuals were asked to identify as many words as they could recognize within a given row by drawing a line indicating where each word starts and/or finishes.

The TOSCRF is similar to the TOSCRF however participants are presented with a series of sentences, rather than rows of random words. Similarly, the words are written without any spaced between them. Individuals had three minutes to identify as many words as they could within each of the sentences by indicating the boundaries between words.

Reading Motivation. Motivation literature is growing however some constructs have been more widely covered than others. Furthermore, reading motivation literature that is specific to an adult population is scarce. Thus, it was felt that is was critical to include more than one measure of motivation in order to gain a larger scope of motivational beliefs and, furthermore, to contribute to the field by working to fill the gap in the literature on adult motivation in this field. Additionally, there are overlapping constructs among the three measures of motivation allowing for thorough investigation of each motivation construct. Among the three measures used there are at least two indicators for each construct. Each measure takes approximately five minutes to complete and is in the form of a questionnaire, each with its own variation of a Likert-type scale rating system. For sample one, members of the research team worked one-on-one with participants to complete the questionnaires, reading and responding item by item for each. However, for the second sample the measures were administered in a group environment and, as such, were treated as independent self-report measures

The Intrinsic Motivation Inventory (IMI) (Ryan, 1982). This self-report measure consists of 29 items rated on a five point Likert-type scale ranging from not at all true to completely true. The IMI assesses critical constructs of motivation including: Interest/Enjoyment, Sense of Competence, Perceived Effort, and Pressure/Tension. For the purposes of this study only the calculated score for interest/enjoyment (ex. "I like reading") was used. Lower scores suggest lower levels of interest for reading, while higher scores indicate greater reading interest and enjoyment. See Appendix B for a complete list of items.

The Expectancies Value Questionnaire (EVQ) (Eccles & Wigfield, 1995; 2002). The EVQ is comprised of 15 items rated on a seven point Likert-type scale ranging from either the most or least for each item (e.g. I like reading, 1 = a little to 5 = a lot). This self-report measure assesses the following two dimensions of motivational constructs: the cognitive appraisal of expectancy for success (i.e. self-concept) and the affective evaluation of the learning target (i.e. reading value). For the purposes of this study only a calculated score for reading value (ex. "Compared to other activities how important is it to be good at reading?") was used. For reading value higher scores indicate a greater sense of value for reading. See Appendix C for a complete list of items.

The Reading Motivation Scale (RMS) (Guthrie & Wigfield, 2009). The RMS is another self-report measure that follows similar administration procedures as the previous two measures of motivation. A total of 28 items are rated on a four point Likert-type scale ranging from never true to always true. This involves a series of statements based on reading, which then asks individuals to rate how true each statement is for them. The RMS is comprised of four scales that assess Intrinsic Motivation, Perceived Difficulty,

Self-Efficacy and Avoidance. For the purposes of this study only the calculated scores for intrinsic motivation (ex. “Do you enjoy reading in your free time?”) , self-efficacy (ex. “Do you think you will read things well next year?” and avoidance (ex. “Do read as little as possible?”) were used. A higher score indicates a greater degree of intrinsic motivation, more avoidance, and greater sense of self-efficacy. See Appendix D for a complete list of items.

Results

Data Analyses

Once motivation constructs were identified and ability groupings were defined, SPSS software was used to investigate both univariate and multivariate assumptions. Afterward, regression models were run to investigate the multifaceted nature of adult reading motivation to answer the previously mentioned research questions. To address the first research question descriptive statistics and correlations among demographics, motivation constructs and reading achievement variables were investigated. Demographics variables included were as follows: sex, age, race, and language status. For the race variable a composite variable was computed due to the small representation of non-Caucasian groupings. Thus, this resulted in one race variable identifying individuals as either ‘Caucasian’ or ‘Non-Caucasian’. Language status was identified as an individual’s first language being English (L1) or another language (L2). The motivation constructs included were as follows: reading value, self-efficacy, avoidance, intrinsic motivation and interest/enjoyment; and reading achievement throughout was identified as reading fluency on both the TOSWRF and TOSCRF. Correlational findings were then further investigated via hierarchical regressions, examining moderation effects.

For the second research question a hierarchical linear regression model was performed to examine the moderating role of reading ability in the relationship between self-efficacy and reading achievement. For the purposes of this study reading achievement was defined as reading fluency as assessed by the TOSCRF and the TOSWRF. The reading ability moderator variable was established using an ability-grouping variable. All covariates were entered in the first step as follows: sex, language status, race, and age. The second step included a score for self-efficacy, determined by item groupings on the RMS (Guthrie & Wigfield, 2009). The dependent variable was a total calculated raw score on the TOSCRF, a measure of reading fluency skill. This model was run a second time using the TOSWRF as the dependent variable. Age moderation was also explored for both regression models, controlling for ability grouping.

For the third research question four hierarchical linear regression models were investigated. For each model all of the following covariates were included in the first step: sex, language status, race, and age. For the second step the independent variable and the moderator were entered as individual variables. For each model the moderator was ability, as defined using the WJ-III reading fluency ability-grouping variable. The independent variable for the first model was intrinsic motivation, for the second and model interest/enjoyment and for the third model avoidance. Each independent variable was determined using a calculated score from the associated motivation measures. A reading value score was derived from the EVQ (Eccles & Wigfield, 1995; 2002), an interest/enjoyment score was derived from the IMI (Ryan, 1982); and finally the self-efficacy, intrinsic motivation, and avoidance scores were derived from the RMS (Guthrie

& Wigfield, 2009). The third step for each model was an interaction variable computed by multiplying the independent and moderator variables for each analysis. Each model was re-run replacing the ability moderator with an age moderator to investigate the influence of an age interaction term. For these age moderation models, the ability-grouping variable was re-entered in the first step as a covariate.

Preliminary Analyses

Establishing motivation groupings. As previously discussed, research questions for the current study sought to adopt components of Marsh and colleagues' (2003) Big-Two-Factor Theory by examining both learning and performance motivation types. Intrinsic motivation and interest/enjoyment are similar subtypes both associated with an internal drive or rationale to take part in a given task (Schiefele et al., 2012). Marsh and colleagues (2003) identified such factors to be associated with the learning motivation factor as they are typically associated with a desire or willingness to engage with reading. Meanwhile self-efficacy has traditionally been viewed as a form of performance motivation as this subtype closely linked with achievement outcomes and feelings of competency (Diseth, 2011; Marsh et al., 2003; Wigfield & Eccles, 2000).

The present study also examined the role of avoidance which could be classified as either factor category. For the purposes of this study avoidance was investigated as a form of learning motivation. While past experiences with reading, in particular failures, may lead to greater avoidance (Roberts et al., 2008), qualitative findings have found contradictory results. Duncan (2009) found that adult learners despite learning difficulties still demonstrated interest in reading. Thus, it was hypothesized that avoidance would be better identified as a form of learning motivation for an adult learner population,

especially among those who have sought out continuing education programs, demonstrating an interest in learning. Pearson r correlations were examined to see how avoidance was related to the other motivation constructs. Findings demonstrated stronger relationships between avoidance and both intrinsic motivation (r = -.490, p < .001) and interest/enjoyment (r = -.425, p < .001) in comparison to self-efficacy (r = -.175, p < .001) (see Table 1). Thus, avoidance was more strongly correlated with learning motivation constructs than with performance motivation constructs. Research question two examined reading motivation in the context of performance motivation (i.e. self-efficacy). Meanwhile, research question three investigated relationships among learning motivation constructs (i.e. intrinsic motivation, interest/enjoyment and avoidance).

Establishing ability groupings. Ability groupings were used to examine relationships among motivation constructs as well as with achievement. Struggling readers were broadly identified as individuals with a history of reading difficulties as opposed to being identified specifically as struggling readers or as individuals with reading or learning disabilities. An ability grouping variable was established to examine the motivation and reading achievement relationships between those who have a history of reading difficulties (RD) and typically developing learners with little to no reading difficulties (NRD). The RD classification then represents having a history of reading difficulties while NRD is most closely representative of the traditional 'typically developing' population often discussed comparatively in disability research.

Participants with standard scores < 85 were classified as RD. A total of 143 participants were classified as RD, while 193 (57.44%) were classified as NRD. Group differences between ability groupings were then explored. Significant differences in age

were found between ability groupings $t(334) = 5.957$, $p < .001$. Participants classified as NRD were on average younger ($M = 26.77$, $SD = 11.71$) in comparison to those classified as RD ($M = 35.38$, $SD = 14.75$). This was most likely associated with the university recruitment sample, as the majority of the population represented a younger age range and represented a large portion of NRD grouping. However, frequencies of the sample indicated that there were individuals with similar ages across both recruitment samples, as well as across ability groupings. Refer to Table 2 and Table 3 for details on participant demographics, as well as ranges across reading achievement and motivation variables. Individuals were equally likely to be classified as either RD or NRD regardless of whether or not English was their first language ($X^2(1) = 2.674$, $p = .116$). Similarly, both males and females were equally likely to be classified as either RD or NRD ($X^2(1) = 2.657$, $p = .117$). However significant differences were found for race ($X^2(1) = 62.873$, $p < .001$). Approximately 14.05% individuals who identified as Caucasian were classified as RD, while approximately 58.60% of individuals who identified with a race other than Caucasian were classified as RD.

Univariate assumptions. All independent and dependent variables were assessed for univariate assumptions of normality involving, missing values, skewness, kurtosis, and outliers. Of the original 387 participants, seven cases were removed (1.81%) upon initial screening of missing data. Examination of missing values revealed that these seven cases were missing data across multiple variables, including outcome variables. If only a small percentage of cases are missing a data across multiple variables deletion is a good option, especially among larger sample sizes (Tacbachnick & Fidell, 2007). Thus, given the sample size and also that these seven cases were missing multiple data points,

including outcome variables, they were removed reducing the sample size to 380. Chi-squared and independent sample t-tests were conducted to investigate group differences between those who were included (n = 380) and the seven cases that were removed. No significant differences were found ($p < .05$), suggesting that the missing values were missing completely at random (Tabachnick & Fidell, 2007).

From the remaining sample only a small percentage of data was still missing. When approximately 5% or less of the data are missing for a variable there is less cause for concern (Tacbnick & Fidell, 2007). Only one case was missing age so this case was assigned a mean value for age from the whole sample. Mean substitution is an accepted method for dealing with missing values as using a sample mean is the best estimate for the population mean (Tabachnick & Fidell, 2007). Sex, language status and race were also missing values. Sex (1.05%) and language status (2.89%) were both missing less than 5% of data and therefore were not cause for concern (Tabachnick & Fidell, 2007). Race was missing 7.89% of data however due to the categorical nature of this variable imputation was not used. Since race was a covariate across analyses these cases were excluded, reducing the sample size to 336. Significant differences between those missing and not missing race were found for sex $X^2(1) = 4.191$, $p = .053$), language status ($X^2(1) = 14.257$, $p = .001$) and age ($t(38.234) = -2.407$, $p = .021$). Of those missing race 18 (60%) were male and 12 were female. A total of 13 (44.8%) spoke English as their first language. Finally, participants who did not disclose their race were younger (M = 25. 60, SD = 10.44) than those who identified their race (M = 30.52, SD = 13.77).

All variables were then screened for skewness and kurtosis. All independent and dependent variables were within normal limits for both skewness and kurtosis. Next, all

variables were assessed for univariate outliers. Using a cut off of three standard deviations or more beyond the mean to determine severe outlier cases (Tabachnick & Fidell, 2007). No variables presented any problem cases, with the exception of the reading value motivation variable. Reading value presented three potential outlier cases falling beyond three standard deviations from the mean (Tacbachnick & Fidell, 2007). However, no changes were made to these cases at the univariate level as it is likely to find extreme scores falling beyond this threshold among larger samples and the total extent of the problem should be identified before determining how to handle outlier cases (Tabachnick & Fidell, 2007). Thus, given the size of the sample within the current study, these cases were noted as potential outliers and further investigated as potential multivariate outliers.

Multivariate assumptions. All predictor variables were assessed to satisfy assumptions of normality, linearity and homoscedasticity and multicollinearity. All motivation variables were assessed as standardized scores. Mean centring can be useful when predictors do not have a meaningful score of zero and furthermore can assist in avoiding issues associated with multicollinearity (Field, 2013). Intrinsic motivation and interest/enjoyment measure virtually the same motivation subtype and as such were highly correlated (r = .804, p = .000). Variables that were highly correlated were not included as predictors within the same regression analysis. There were no other concerns regarding multicollinearity among predictor variables. See Table 1 for a complete list of correlations for all variables. When assessing normality Shapiro-Wilk's test is biased by sample size, thus normal probability plots were investigated for this assumption. All variables satisfied the assumption of multivariate normality. Next scatterplot matrices

indicated that all variables had linear relationships with one another and did not violate the assumption of homoscedasticity.

Finally, all variables were assessed for multivariate outliers, with the three earlier univariate cases especially in mind. Variables were screened for outliers using criteria for Mahalanobis distance with $p < .001$ and degrees of freedom according to the total number of predictor variables per model (Tabachnick & Fidell, 2007). Across regression models a few cases were identified as multivariate outliers, including one of the three potential univariate outliers for two models. Multivariate outliers were identified using the Mahalanobis distance criteria. All regression models were run with and without outlier cases. For the majority of models no significant differences were found, demonstrating similar trends across all regression results. For one model, interest and age interaction with reading value, there was a change from significant to non-significant results. This suggested extreme influence of one identified outlier case. Furthermore, upon removing this case, three more outliers were identified and regressions changed from non-significant back to significant. Thus, once all final outliers were removed this model demonstrated similar trends in results as those when all outlier cases were included. Examining these cases indicated that outliers represented some of the oldest participants and three out of the four outliers had relatively low levels of interest motivation. Overall, it was decided that all outlier cases would remain a part of the current sample due to limited differences in models run both with and without outliers. Furthermore, it was felt that with a gap in the literature surrounding adult literacy and motivation these individuals very well could have been representative of the larger target population.

Table 1

Correlations between Independent and Dependent Variables (N = 336)

	2	3	4	5	6	7	8	9
1. Self-Efficacy	.220**	.124*	.091	-.175**	.330**	.271**	.342**	-.228**
2. Intrinsic Motivation	-	.804**	.723**	-.490**	-.123*	-.158**	-.120*	.187**
3. Interest/Enjoyment		-	.728**	-.425**	-.152**	-.181**	-.116*	.268**
4. Reading Value			-	-.440**	-.249**	-.287**	-.267**	.318**
5. Avoidance				-	-.180**	-.147**	-.168**	.111*
6. TOSWRF					-	.887**	.762**	-.436**
7. TOSCRF						-	.825**	-.489**
8. WJ-III Reading Fluency							-	-.357**
9. Age								-

Note: *p <.05, **p <.01

Descriptive Statistics and Correlations

The sample (N = 336) was drawn from a larger study investigating the cognitive and motivational needs and the characteristics of adult learners. Demographics and ability groupings were explored to better understand the motivational characteristics of adult literacy learners. Mean comparisons, independent samples t-tests and Pearson r correlations were used to examine group differences and associations for all motivation variables (i.e. self-efficacy, intrinsic motivation, interest/enjoyment, avoidance, and reading value).

Sex. Findings showed that approximately 41.07% identified as male as opposed to female. Significant group differences were found for sex on reading value (t(260.234) = -4.633, p < .001), interest/enjoyment (t(334) = -4.556, p < .001), intrinsic motivation (t(264.804) = -3.946, p < .001) and self-efficacy (t(334) = 2.393, p = .017). Those who identified as male had slightly lower scores of reading value (M = 5.02, SD = 1.07),

interest/enjoyment (M = 2.96, SD = 1.04), and intrinsic motivation (M = 2.75, SD = .64) in comparison to those who identified as a female (M = 5.53, SD = .89; M = 3.48, SD = 1.03; M = 3.01, SD = .55). However, males had slightly higher scores of self-efficacy (M = 2.87, SD = .33) compared to females (M = 2.78, SD = .35). No significant differences were found between sexes in regards to avoidance (t(273.569) = 1.854, p = .065).

Race. Approximately 36.01% of the sample identified as Caucasian. Significant group differences were found for race on reading value (t(334) = 3.831, p < .001), interest/enjoyment (t(233.252) = 2.051, p = .041), and self-efficacy (t(249.741) = -3.879, p < .001). Those who identified as Caucasian had slightly lower scores of reading value (M = 5.05, SD = 1.06) and interest/enjoyment (M = 3.11, SD = 1.11) in comparison to those who identified as a different racial group (i.e. Non-Caucasian) (M = 5.48, SD = .93; M = 3.36, SD = 1.03). Those who identified as Caucasian however had slightly higher scores of self-efficacy (M = 2.91, SD = .34) compared to other racial groupings (M = 2.77, SD = .34). No significant differences were found across race groupings for both intrinsic motivation (t(334) = 1.795, p = .074) and avoidance (t(334) = 951, p = .342).

Language Status. A total of 77.08% indicated that they spoke English as their first language. Significant group differences were found between L1 and L2 learners on avoidance (t(334) = -2.186, p = .030) and self-efficacy (t(334) = 2.202, p = .028). L1 learners had slightly lower scores of avoidance (M = 2.23, SD = .49) compared to L2 learners (M = 2.37, SD = .39). Furthermore, those who spoke English as their first language also had slightly greater scores of self-efficacy (M = 2.84, SD = .35) compared to L2 learners (M = 2.74, SD = .32). No significant differences were found between L1

and L2 learners for reading value ($t(334) = -.605$, $p = .545$), interest/enjoyment ($t(334) = -1.455$, $p = .146$) and intrinsic motivation ($t(150.645) = -.510$, $p = .611$).

Age. From this sample, participants ranged in age from 16 to 70 years old ($M = 30.43$, $SD = 13.75$). Pearson r correlations presented significant results between age and all motivation variables. A small negative relationship was found between age and self-efficacy ($r = -228$; $p < .001$). Additionally for age there were positive correlations with small to moderate effect sizes for intrinsic motivation ($r = .187$; p .001), interest/enjoyment ($r = .268$, $p < .001$), reading value ($r = .318$, $p < .001$) and avoidance ($r = .111$; $p = .042$).

Ability groupings. Significant differences were found between ability groupings on reading value ($t(331.800) = -4.274$, $p = .000$), avoidance ($t(334) = -2.758$, $p = .006$) and self-efficacy ($t(334) = 5.107$, $p = .000$). Participants classified as RD on average had slightly greater scores of reading value ($M = 5.58$; $SD = .85$) in comparison to those classified as NRD ($M = 5.13$, $SD = 1.06$). However participants classified as RD had slightly greater scores of avoidance ($M = 2.35$, $SD = .47$) and slightly lower scores of self-efficacy ($M = 2.71$, $SD = .34$) in comparison to those classified as NRD ($M = 2.20$, $SD = .46$; $M = 2.90$, $SD = .33$). No significant differences were found between ability groupings on interest/enjoyment ($t(334) = -1.548$, $p = .123$) and intrinsic motivation ($t(334) = -1.333$, $p = .184$). See Table 2 for further details regarding the descriptive statistics for the whole sample as well as across recruitment samples for all variables.

Table 2.

Descriptive Statistics for Age and Motivation Across Recruitment Samples (N= 336)

Variable		Whole Sample (N=336)	CSAL Sample (n=198)	Range	Brock Sample (n=138)	Range
Reading Value	Mean	5.32	5.63	2.63—7.00	4.88	1.38—6.75
	SD	1.00	.85		1.03	
Intrinsic Motivation	Mean	2.90	2.99	1.29—4.00	2.78	1.00—4.00
	SD	.60	.58		.61	
Interest/Enjoyment	Mean	3.27	3.46	1.00—5.00	3.00	1.00—5.00
	SD	1.06	.99		1.11	
Avoidance	Mean	2.26	2.30	1.29—3.57	2.22	1.29—3.43
	SD	.47	.48		.46	
Self-Efficacy	Mean	2.82	2.73	1.86—3.57	2.95	2.14—3.57
	SD	.34	.34		.31	
Age	Mean	30.44	37.18	16—70	20.76	18—30
	SD	13.75	14.42		1.84	
TOSWRF	Mean	109.87	89.88	2—156	138.54	64—191
	SD	35.83	27.39		25.60	
TOSCRF	Mean	103.63	78.83	10—155	139.20	60—220
	SD	42.10	27.44		32.98	
WJ-III Reading Fluency Standard Score	Mean	90.29	81.67	64—111	102.65	72—117
	SD	13.46	7.43		10.12	

Reading skill correlations: TOSWRF and TOSCRF: The WJ-III reading fluency subtest was solely used to establish ability groupings. Correlations and regression analysis for the current study examined reading fluency achievement via total raw scores on both the TOSWRF and TOSCRF. Significant negative correlations were found for all motivation subtypes in relation to all measures of reading fluency with the exception of self-efficacy, which demonstrated significant positive relationships. Refer back to Table 1 for a complete list of motivation and achievement correlations.

Table 3.

Frequencies for Participant Demographics Across Samples

Variable		Frequencies (%)		
		Brock Sample n = 138	CSAL Sample n = 198	Whole Sample (N = 336)
Sex	Male	65 (47.1)	73 (36.9)	138 (41.1)
	Female	73 (52.9)	125 (63.1)	198 (58.9)
Race	Caucasian	86 (62.3)	35 (17.7)	121 (36.0)
	Other	52 (37.7)	163 (82.3)	215 (64.0)
Language Status	L1	109 (79.0)	150 (75.8)	259 (77.1)
	L2	29 (21.0)	48 (24.2)	77 (22.9)
Ability Grouping	NRD	132 (95.7)	61 (30.8)	193 (57.4)
	RD	6 (4.3)	137 (69.2)	143 (42.6)

Correlations among motivation subtypes. Pearson r correlations demonstrated several significant correlations among all motivation variables. Small positive correlations were found between self-efficacy and intrinsic motivation (r = .220, p = .000) as well as interest/enjoyment (r = .124, p = .023). A small negative correlation was found between self-efficacy and avoidance (r = -.175, p = .001). A strong positive correlation was found between intrinsic motivation and reading value (r = .723, p = .000). Also a strong negative correlation was found between intrinsic motivation and avoidance (r = -.490, p = .000). Similarly interest/enjoyment demonstrated a strong positive relationship with reading value (r = .728, p = .000) and a strong negative relationship

with avoidance (r = -.425, p .000). A moderate negative correlation was found between avoidance and reading value (r = -.440, p = .000). No significant relationship was found between self-efficacy and reading value. Refer back to Table 1 for a complete list of all correlations between motivation subtypes.

A Motivation-Reading Achievement Relationship: Self-Efficacy and Fluency

A three-step hierarchical regression analysis was performed to investigate the influence of self-efficacy and ability (RD versus NRD) on reading fluency scores. For this regression motivation was defined as self-efficacy and the dependent achievement variable was entered as a calculated raw score for reading fluency. Furthermore this analysis examined whether reading ability moderates the relationship between motivation and achievement. The ability moderator was defined by the previously noted ability-grouping variable. The interaction term was established by multiplying the motivation predictor self-efficacy with the ability-grouping variable. As previously stated, mean centring was used for interaction terms to avoid issues associated with multicollinearity (Field, 2013).

Due to the nature of the sample and to investigate potential developmental implications the above regression was run twice with two different dependent variables; once with the TOSWRF and once with the TOSCRF. This examined whether age was a significant moderator in the relationship between self-efficacy and achievement. Ability was removed as a predictor and replaced by age in second step of the regression. Ability was then re-entered as a covariate in step one. This was done for both models (i.e. TOSWRF and TOSCRF).

TOSWRF. In the first step sex, language status, race and age significantly predicted 30.9% of the variance in TOSWRF achievement (ΔR^2 = .309, F(4, 331) = 38.339, p < .001). In the second step self-efficacy and the ability-grouping variable were entered and significantly predicted an additional 19.4% of the variance in TOSWRF scores (ΔR^2 = .503, F(6, 329) = 57.464, p < .001). In the final step the ability interaction term was entered which demonstrated a small moderation effect between self-efficacy and TOSWRF fluency achievement (β = -.166, p = .002). This accounted for an addition 1.3% of the variance in TOSWRF achievement (ΔR^2 = .516, F(7, 329) = 57.464, p < .001). Table 4 displays unstandardized regression coefficients and standardized beta coefficients, R^2 and adjusted R^2 values for all variables at each step in the regression.

Post hoc visual examination of a grouped scatterplot indicated there was a strong positive relationship for the NRD ability grouping relative to a weak relationship for the RD group when testing the influence of a self-efficacy and ability interaction term on reading achievement. See Figure 1 for an illustration of the self-efficacy ability interaction term for TOSWRF reading outcome.

Controlling for age. Sex, language status, race, and ability grouping explained 44.5% of the variance for TOSWRF scores (ΔR^2 = .445, F(4, 331) = 68.103, p < .001). In the second step self-efficacy and age explained an additional 5.8% of the variance (ΔR^2 = .503, F(6, 329) = 57.464, p < .001). In the final step age also demonstrated a small moderation effect in the relationship between self-efficacy and TOSWRF achievement. The age interaction term (β = -.339, p < .001) accounted for an additional 1.7% of variance (ΔR^2 = .520, F(7, 328) = 52.745, p < .001). Table 5 displays both standardized

and unstandardized regression coefficients as well as both $R^2$and adjusted R^2 for all variables at each step in the regression.

Table 4

Summary of Hierarchical Regression Predicting TOSWRF: Ability Interaction

Variable	B	β	*t*	R^2	ΔR^2
Step 1				.317	.309
(Constant)	136.633		17.400***		
Sex	10.010	.138	2.953***		
Language Status	-15.608	-.183	-4.026**		
Race	22.226	.298	6.381***		
Age	-1.035	-.397	-8.345***		
Step 2				.512	.503
(Constant)	150.724		21.618***		
Sex	3.384	.047	1.144		
Language Status	-10.358	-.122	-3.108**		
Race	6.825	.092	2.101*		
Age	-.670	-.257	-6.073***		
Self-Efficacy	1.761	.048	1.169		
Ability	-36.671	-.507	-11.022***		
Step 3				.526	.516
(Constant)	150.777		21.920***		
Sex	2.963	.041	1.015		
Language Status	-10.251	-.120	-3.117**		
Race	5.649	.076	1.751		
Age	-.666	-.256	-6.121***		
Self-Efficacy	5.896	.161	2.981**		
Ability	-37.649	-.520	-11.419***		
Interaction	-9.270	-.166	-3.167**		

Note. $N = 336$; *$p < .05$, **$p < .01$, ***$p < .001$

Post hoc visual examination of a grouped scatterplot was used to further evaluate significant age moderation results. The age variable was split by its median (i.e. into 'younger' and 'older' age groupings of participants). Scatterplots showed a stronger relationship for the younger half of the sample in comparison to the older half of the sample. See Figure 2 for an illustration of the self-efficacy age interaction term for TOSWRF reading outcome.

Table 5

Summary of Hierarchical Regression Predicting TOSWRF: Age Interaction

Variable	B	β	*t*	R^2	ΔR^2
Step 1				.451	.445
(Constant)	139.286		20.379***		
Sex	-1.415	-.019	-.469		
Language Status	-9.722	-.114	-2.778**		
Race	8.650	.116	2.536*		
Ability	-43.080	-.595	-12.957***		
Step 2				.512	.503
(Constant)	150.724		21.618***		
Sex	3.384	.047	1.144		
Language Status	-10.358	-.122	-3.108**		
Race	6.825	.092	2.101*		
Ability	-36.671	-.507	-11.022***		
Self-Efficacy	1.761	.048	1.169		
Age	-.670	-.257	-6.073***		
Step 3				.530	.520
(Constant)	150.804		22.002***		
Sex	2.965	.041	1.019		
Language Status	-9.515	-.112	-2.896**		
Race	6.255	.084	1.957		
Ability	-36.827	-.509	-11.258***		
Self-Efficacy	13.061	.357	3.701***		
Age	-.714	-.274	-6.536***		
Interaction	-.375	-.339	-3.527***		

Note. $N = 336$; *$p < .05$, **$p < .01$, ***$p < .001$

TOSCRF. In the first step sex, language status, race and age significantly predicted 37% of the variance in TOSCRF achievement ($\Delta R^2 = .370$, $F(4, 331) = 50.140$, $p < .001$). In the second step self-efficacy and the ability-grouping variable were entered accounted for an additional 18.3% of the variance in TOSCRF scores ($\Delta R^2 = .553$, $F(6, 329) = 69.971$, $p < .001$). In the final step the ability interaction term was entered which demonstrated a small moderation effect between self-efficacy and TOSCRF fluency achievement ($\beta = -.251$, $p < .001$). This accounted for an additional 2.3% of the variance in TOSCRF achievement ($\Delta R^2 = .576$, $F(7, 328) = 66.042$, $p < .001$). Table 6 displays unstandardized regression coefficients and standardized beta coefficients, R^2 and adjusted R^2 values for all variables at each step in the regression.

Post hoc visual examination of a grouped scatterplot suggested a weaker relationship for the RD ability grouping compared to a strong positive relationship for the NRD group when testing the influence of a self-efficacy and ability interaction term on reading achievement. See Figure 3 for an illustration of the self-efficacy ability interaction term for TOSCRF reading outcome.

Table 6

Summary of Hierarchical Regression Predicting TOSCRF: Ability Interaction

Variable	B	β	*t*	R^2	ΔR^2
Step 1				.377	.370
(Constant)	143.819		16.325***		
Sex	11.861	.139	3.119**		
Language Status	-21.509	-.215	-4.945***		
Race	26.040	.297	6.664***		
Age	-1.379	-.450	-9.917***		
Step 2				.561	.553
(Constant)	157.099		20.217***		
Sex	4.973	.058	1.509		
Language Status	-15.093	-.151	-4.063***		
Race	8.407	.096	2.323*		
Age	-.950	-.310	-7.717***		
Self-Efficacy	4.397	.102	2.620**		
Ability	-40.033	-.471	-10.796***		
Step 3				.585	.576
(Constant)	157.180		20.779***		
Sex	4.332	.051	1.349		
Language Status	-14.930	-.149	-4.129***		
Race	6.616	.076	1.865		
Age	-.945	-.309	-7.890***		
Self-Efficacy	10.693	.249	4.916***		
Ability	-41.522	-.488	-11.452***		
Interaction	-14.113	-.215	-4.384***		

Note. $N = 336$; *$p < .05$, **$p < .01$, ***$p < .001$

Controlling for age. Sex, language status, race, and ability grouping explained 45.7% of the variance for TOSCRF scores ($\Delta R^2 = .457$, $F(4, 331) = 71.531$, $p < .001$). In the second step self-efficacy and age explained an additional 9.6% of the variance ($\Delta R^2 = .553$, $F(6, 329) = 69.971$, $p < .001$). In the final step age also demonstrated a small moderation effect in the relationship between self-efficacy and TOSCRF achievement. The age interaction term ($\beta = -.339$, $p < .001$) accounted for an additional 1.6% of

variance (ΔR^2 = .569, $F(7, 328) = 64.294$, $p < .001$). Table 7 displays both standardized and unstandardized regression coefficients as well as both $R^2$and adjusted R^2 for all variables at each step in the regression.

Post hoc visual examination of a grouped scatterplot was used to further evaluate significant age moderation results. The age variable was split by its median (i.e. into 'younger' and 'older' age groupings of participants). Scatterplots showed a stronger relationship for the younger half of the sample in comparison to the older half of the sample. See Figure 4 for an illustration of the self-efficacy age interaction term for TOSCRF reading outcome.

Table 7

Summary of Hierarchical Regression Predicting TOSCRF: Age Interaction

Variable	B	β	*t*	R^2	ΔR^2
Step 1				.464	.457
(Constant)	142.471		17.941***		
Sex	-2.343	-.027	-.669		
Language Status	-14.596	-.146	-3.590***		
Race	11.396	.130	2.869**		
Ability	-49.991	-.588	-12.941***		
Step 2				.561	.553
(Constant)	157.099		20.217***		
Sex	4.973	.058	1.509		
Language Status	-15.093	-.151	-4.063***		
Race	8.407	.096	2.323*		
Ability	-40.033	-.471	-10.796***		
Self-Efficacy	4.397	.102	2.620**		
Age	-.950	-.310	-7.727***		
Step 3				.578	.569
(Constant)	157.192		20.619***		
Sex	4.482	.052	1.385		
Language Status	-14.104	-.141	-3.860***		
Race	7.738	.088	2.176*		
Ability	-40.216	-.473	-11.054***		
Self-Efficacy	17.656	.411	4.498***		
Age	-1.001	-.327	-8.246***		
Interaction	-.440	-.339	-3.721***		

Note. $N = 336$; *$p < .05$, **$p < .01$, ***$p < .001$

Ability Moderation in the Relationship between Motivational Constructs

Three hierarchical regression analyses were run to better understand how different motivation constructs influence one another. Two measures of intrinsic motivation, as well as a measure of avoidance, were entered in separate analyses as predictors of reading value. Similar to previous analyses, each model examined whether reading ability moderated the relationship between motivation constructs. Findings may have implications for the interaction of motivation subtypes for typical versus struggling readers. The interaction term was established by multiplying the motivation predictors with the ability-grouping variable. Furthermore, each analysis was re-run to investigate age moderation for all models. As in previous analyses ability was removed as a predictor and replaced by age in the second step of the regression. Ability was then re-entered as a covariate in step one. This was done for all models.

Intrinsic Motivation and Reading Value. In the first step sex, language status, race and age significantly predicted 14.4% of the variance in reading value ($\Delta R^2 = .144$, $F(4, 331) = 15.075$, $p < .001$). In the second step an additional 43% of the variance in reading value was explained with the addition of intrinsic motivation and the ability-grouping variable ($\Delta R^2 = .574$, $F(6, 329) = 76.214$, $p < .001$). The ability interaction term was entered in the final step. Results demonstrated that ability grouping was a significant moderator in the relationship between intrinsic motivation and reading value ($\beta = -.141$, $p = .002$). The ability interaction term accounted for an additional 1.1% of the variance ($\Delta R^2 = .585$, $F(7, 328) = 68.324$, $p < .001$). Table 8 displays unstandardized regression coefficients and standardized beta coefficients, R^2 and adjusted R^2 values for all variables at each step in the regression.

Post hoc visual examination of a grouped scatterplot indicated a stronger positive relationship for the NRD ability grouping relative to the RD group when testing the influence of an intrinsic motivation and ability interaction term on reading value. See Figure 5 for an illustration of the intrinsic motivation ability interaction term for reading value.

Table 8

Summary of Hierarchical Regression Predicting Reading Value: Intrinsic Motivation and Ability Interaction

Variable	B	β	*t*	R^2	ΔR^2
Step 1				.154	.144
(Constant)	-1.082		-4.447***		
Sex	.380	.188	3.617***		
Language Status	.058	.024	.482		
Race	-.272	-.131	-2.525*		
Age	.018	.248	4.691***		
Step 2				.582	.574
(Constant)	-.596		-3.340**		
Sex	.178	.088	2.311*		
Language Status	.004	.002	.046		
Race	-.107	-.052	-1.284		
Age	.009	.126	3.217**		
Intrinsic Motivation	.650	.667	18.025***		
Ability	.239	.119	2.828**		
Step 3				.593	.585
(Constant)	-.596		-3.382**		
Sex	.170	.084	2.236*		
Language Status	.011	.005	.136		
Race	-.091	-.044	-1.103		
Age	.009	.126	3.250**		
Intrinsic Motivation	.739	.758	16.078***		
Ability	.253	.126	3.029**		
Interaction	-.215	-.141	-3.059**		

Note. $N = 336$; *$p < .05$, **$p < .01$, ***$p < .001$

Controlling for age. In the first step sex, language status, race, and ability grouping explained 12% of the variance for reading value ($\Delta R^2 = .120$, $F(4, 331) = 12.431$, $p < .001$). Next intrinsic motivation and age were entered explaining an additional 45.4% of the variance ($\Delta R^2 = .574$, $F(6, 329) = 76.214$, $p < .001$). Finally, results showed that the age interaction term was not a significant predictor of reading

value (β = -.131, p = .138). Table 9 displays both standardized and unstandardized regression coefficients as well as both R^2 and adjusted R^2 for all variables at each step in the regression.

Post hoc visual examination of a grouped scatterplot was used to further evaluate significant age moderation results. The age variable was split by its median (i.e. into 'younger' and 'older' age groupings of participants). Scatterplots showed a stronger relationship for the younger half of the sample in comparison to the older half of the sample. See Figure 6 for an illustration of the intrinsic motivation age interaction term for reading value.

Table 9

Summary of Hierarchical Regression Predicting Reading Value: Intrinsic Motivation and Age Interaction

Variable	B	β	*t*	R^2	ΔR^2
Step 1				.131	.120
(Constant)	-.905		-3.781***		
Sex	.532	.263	5.035***		
Language Status	-.002	-.001	-.017		
Race	-.192	-.093	-1.607		
Ability	.411	.204	3.531***		
Step 2				.582	.574
(Constant)	-.596		-3.340**		
Sex	.178	.088	2.311*		
Language Status	.004	.002	.046		
Race	-.107	-.052	-1.284		
Ability	.239	.119	2.828**		
Intrinsic Motivation	.650	.667	18.025***		
Age	.009	.126	3.217**		
Step 3				.584	.576
(Constant)	-.592		-3.323**		
Sex	.171	.085	2.224*		
Language Status	-.003	-.001	-.031		
Race	-.108	-.052	-1.298		
Ability	.229	.114	2.713**		
Intrinsic Motivation	.765	.784	8.997***		
Age	.010	.139	3.474**		
Interaction	-.004	-.131	-1.486		

Note. N = 336; *p < .05, **p < .01, ***p < .001

Interest/enjoyment and reading value. Language status, race and age significantly predicted 14.4% of the variance in reading value (ΔR^2 = .144, F(4, 331) = 15.075, p < .001). Next, a score of interest/enjoyment and age were entered in the regression, accounting for an additional 42.1% of the variance in reading value (ΔR^2 = .565, F(6, 329) = 73.618, p < .001). The ability interaction term was entered in the final step. A small moderation effect was found when entering the ability grouping interaction term in the third step (β = -.101, p = .030). This effect accounted for an additional 0.5% of the variance in reading value (ΔR^2 = .570, F(7, 328) = 64.492, p < .001). Table 10 displays unstandardized regression coefficients and standardized beta coefficients, R^2 and adjusted R^2 values for all variables at each step in the regression.

Post hoc visual examination of a grouped scatterplot indicated a stronger positive relationship for the NRD ability grouping relative to the RD group when testing the influence of an interest/enjoyment and ability interaction term on reading value. See Figure 7 for an illustration of the interest/enjoyment ability interaction term for reading value.

Controlling for age. Language status, race, and ability grouping explained 12% of the variance for reading value (ΔR^2 = .120, F(4, 331) = 12.431, p < .001). In the next step an interest/enjoyment score and age were entered explaining an additional 44.5% of the variance (ΔR^2 = .565, F(6, 329) = 73.618, p < .001). Finally, the age interaction term explained an additional 0.6% of the variance in reading value when entered in the final step of the regression (ΔR^2 = .571, F(7, 328) = 64.643, p < .001). Thus age was also a significant moderator in the relationship between interest/enjoyment and reading value (β = -.211, p = .023). However, earlier analyses found two separate levels of outliers that

altered results from significant, to non-significant, back to significant again when removing extreme cases. Thus, these results should be interpreted with caution as they may be driven by outliers. Table 11 displays both standardized and unstandardized regression coefficients as well as both R^2 and adjusted R^2 for all variables at each step in the regression.

Table 10

Summary of Hierarchical Regression Predicting Reading Value: Interest and Ability Interaction

Variable	B	β	*t*	R^2	ΔR^2
Step 1				.154	.144
(Constant)	-1.082		-4.447***		
Sex	.380	.188	3.617***		
Language Status	.058	.024	.482		
Race	-.272	-.131	-2.525*		
Age	.018	.248	4.691***		
Step 2				.573	.565
(Constant)	-.369		-2.015*		
Sex	.174	.086	2.235*		
Language Status	-.088	-.037	-1.015		
Race	-.096	-.046	-1.139		
Age	.005	.066	1.633		
Interest	.667	.676	17.662***		
Ability	.271	.134	3.174*		
Step 3				.579	.570
(Constant)	-3.76		-2.064*		
Sex	.166	.082	2.145*		
Language Status	-.086	-.036	-1.001		
Race	-.080	-.038	-.919		
Age	.005	.072	1.790		
Interest	.729	.739	15.465***		
Ability	.282	.140	3.323**		
Interaction	-.159	-.101	-2.175*		

Note. $N = 336$; *$p < .05$, **$p < .01$, ***$p < .001$

Post hoc visual examination of a grouped scatterplot was used to further evaluate significant age moderation results. The age variable was split by its median (i.e. into 'younger' and 'older' age groupings of participants). Scatterplots showed a stronger relationship for the younger half of the sample in comparison to the older half of the

sample. See Figure 8 for an illustration of the interest/enjoyment age interaction term for reading value.

Table 11

Summary of Hierarchical Regression Predicting Reading Value: Interest and Age Interaction

Variable	B	β	*t*	R^2	ΔR^2
Step 1				.131	.120
(Constant)	-.905		-3.781***		
Sex	.532	.263	5.035***		
Language Status	-.002	-.001	-.017		
Race	-.192	-.093	-1.607		
Ability	.411	.204	3.531***		
Step 2				.573	.565
(Constant)	-.369		-2.015*		
Sex	.174	.086	2.235*		
Language Status	-.088	-.037	-1.015		
Race	-.096	-.046	-1.139		
Ability	.271	.134	3.174**		
Interest	.667	.676	17.662***		
Age	.005	.066	1.633		
Step 3				.580	.571
(Constant)	-.380		-2.086*		
Sex	.173	.085	2.229*		
Language Status	-.101	-.043	-1.176		
Race	-.099	-.048	-1.180		
Ability	.264	.131	3.118**		
Interest	.851	.863	9.542***		
Age	.007	.092	2.209*		
Interaction	-.006	-.211	-2.276*		

Note. $N = 336$; *$p < .05$, **$p < .01$, ***$p < .001$

Avoidance and reading value. In the first step, language status, race and age significantly predicted 14.4% of the variance in reading value ($\Delta R^2 = .144$, $F(4, 331) = 15.075$, $p < .001$). In the second step, avoidance and ability grouping accounted for an additional 24.4% of the variance in reading value ($\Delta R^2 = .388$, $F(6, 329) = 36.469$, $p < .001$). A significant moderation effect was found when the ability grouping interaction term was entered in the final step ($\beta = .176$, $p = .002$). This interaction term accounted for an additional 1.6% of the variance in reading value ($\Delta R^2 = .404$, $F(7, 328) = 33.448$, p

< .001). Table 12 displays unstandardized regression coefficients and standardized beta coefficients, R^2 and adjusted R^2 values for all variables at each step in the regression.

Post hoc visual examination of a grouped scatterplot suggested there was a stronger negative relationship for the NRD ability grouping relative to the RD group when testing the influence of an avoidance and ability interaction term on reading value. See Figure 9 for an illustration of the avoidance ability interaction term for reading value.

Table 12

Summary of Hierarchical Regression Predicting Reading Value: Avoidance and Ability Interaction

Variable	B	β	*t*	R^2	ΔR^2
Step 1				.154	.144
(Constant)	-1.082		-4.447***		
Sex	.380	.188	3.617***		
Language Status	.058	.024	.482		
Race	-.272	-.131	-2.525*		
Age	.018	.248	4.691***		
Step 2				.399	.388
(Constant)	-1.345		-6.394***		
Sex	.307	.152	3.363**		
Language Status	.161	.068	1.560		
Race	-.158	-.076	-1.586		
Age	.019	.266	5.674***		
Avoidance	-.483	-.494	-11.251***		
Ability	.376	.187	3.703***		
Step 3				.417	.404
(Constant)	-1.310		-6.298***		
Sex	.295	.146	3.265**		
Language Status	.151	.064	1.481		
Race	-.166	-.080	-1.679		
Age	.019	.257	5.552***		
Avoidance	-.597	-.610	-10.649***		
Ability	.373	.185	3.725***		
Interaction	.262	.176	3.099**		

Note. $N = 336$; *$p < .05$, **$p < .01$, ***$p < .001$

Controlling for age. Language status, race, and ability grouping explained 12% of the variance for reading value ($\Delta R^2 = .120$, $F(4, 331) = 12.431$, $p < .001$). In the second step, avoidance and age were entered explaining an additional 26.8% of the variance ($\Delta R^2 = .388$, $F(6, 329) = 36.496$, $p < .001$). When examining whether or not age moderated the

relationship between avoidance and reading value, results demonstrated no significant interaction effect for age (β = .069, p = .489). Table 13 displays both standardized and unstandardized regression coefficients as well as both R^2 and adjusted R^2 for all variables at each step in the regression.

Post hoc visual examination of a grouped scatterplot was used to further evaluate significant age moderation results. The age variable was split by its median (i.e. into 'younger' and 'older' age groupings of participants). Scatterplots showed a stronger negative relationship for the younger half of the sample in comparison to the older half of the sample. See Figure 6 for an illustration of the avoidance age interaction term for reading value.

Table 13

Summary of Hierarchical Regression Predicting Reading Value: Avoidance and Age Interaction

Variable	B	β	*t*	R^2	ΔR^2
Step 1				.131	.120
(Constant)	-.905		-3.781***		
Sex	.532	.263	5.035***		
Language Status	-.002	-.001	-.017		
Race	-.192	-.093	-1.607		
Ability	.411	.204	3.531***		
Step 2				.399	.388
(Constant)	-1.345		-6.394***		
Sex	.307	.152	3.363**		
Language Status	.161	.068	1.560		
Race	-.158	-.076	-1.586		
Ability	.376	.187	3.703***		
Avoidance	-.483	-.494	-11.251***		
Age	.019	.266	5.674***		
Step 3				.400	.388
(Constant)	-1.332		-6.306***		
Sex	.307	.152	3.357**		
Language Status	.159	.067	1.541		
Race	-.168	-.081	-1.663		
Ability	.370	.184	3.635***		
Avoidance	-.544	-.556	-5.582***		
Age	.019	.263	5.573***		
Interaction	.002	.069	.693		

Note. N = 336; *p < .05, **p < .01, ***p < .001

Post-Hoc Analyses

To investigate whether there were significant differences between age and ability correlations across motivation constructs t-statistics analyses were used. A formula that calculates the difference between two dependent correlation coefficients (Field, 2013) was used for each correlation pairing (i.e. ability versus age across motivation constructs). Significant differences between age and ability correlations were found across all motivation constructs. Results for differences in correlation coefficients using the t-statistic were as follows: intrinsic motivation ($t(334) = -3.466$, $p < .001$), interest/enjoyment ($t(334) = -4.415$, $p < .001$), avoidance ($t(334) = -3.139$, $p = .002$), reading value ($t(334) = -6.934$, $p < .001$) and self-efficacy ($t(334) = 6.765$, $p < .001$). See Table 1 for a list of correlations among all independent and dependent variables including both age and ability correlations across motivation constructs.

In sum, age was a significant moderator in the performance motivation model examining the relationship between self-efficacy and reading fluency achievement. Ability was also a significant moderation. Post-hoc visual investigations demonstrated stronger relationship for the NRD ability group and younger participants. Accordingly, further post hoc visual examination of all learning motivation models with significant ability interaction terms illustrated stronger relationships for the NRD ability grouping compared to RD. Age was not a consistent moderator across learning motivation analyses.

Discussion

The purpose of this thesis was to investigate the influence of both reading ability and age in motivation and reading achievement relationships; and also among

relationships between various motivations constructs. Age and reading skill were investigated as moderators in the relationship between self-efficacy and reading fluency; and furthermore across six models including learning motivation constructs (i.e. intrinsic motivation, interest and enjoyment, and avoidance) as predictors of reading value. This thesis aimed to address a gap in the literature, which focused on developing a better understanding of the motivational processes of an understudied population of adult struggling readers (Calhoon, et al., 2013; Greenberg, et al., 2011). The major finding was the significant influence of both age and ability as moderators across analyses. For the performance factor motivation analysis (i.e. self-efficacy and reading achievement; Marsh, et al., 2003) both age and ability were significant moderators. However, among analyses with learning factor motivation constructs (i.e. intrinsic motivation, interest/enjoyment, avoidance) ability was a significant moderator across all models, but there were no significant age moderations for all but one model—interest/enjoyment and reading value. Descriptive and correlational analyses detailed the motivational characteristics of adult literacy learners across factors such as sex, race and language status. Findings and implications for each research question will be discussed in greater detail below.

Motivation Characteristics of Adult Literacy Learners: Research Question One

The first research question sought to better understand motivational characteristics and potential construct profiles of adult literacy learners by comparing motivation subtypes across adult learner demographics. This first tier of investigations aimed to gain a better understanding of what personal characteristics are associated with an individual's reading motivation; how do males and females, different racial groups or L1 and L2

learners compare across different motivation constructs. Significant group differences were found for all variables including sex, race and language status.

Sex. Gender differences in relation to academic or achievement motivation have been explored in previous research (Meece, Glienke & Burg, 2006). The current study demonstrated that males had significantly lower scores of reading value, intrinsic motivation and interest/enjoyment, however they had greater scores of self-efficacy. These findings are mostly supported within the context of reading. For instance, Meece and colleagues (2006) conducted a review of motivational gender differences and found that most research illustrates gender-stereotyped subject-oriented dissimilarities. Typically, males show greater levels of interest, value, and competency in mathematics, sports, and science while females demonstrate opposite trends within these domains. However, for music and language arts (i.e. reading and writing), females exhibit a greater sense of value, interest and ability in comparison to males (Meece et al., 2006).

However, differences in self-efficacy between males and females have also typically aligned with gender-stereotyped subject domains (Meece et al., 2006). The current study found that males, despite lower levels of interest, intrinsic motivation and value for reading, had slightly greater scores of reading self-efficacy. It has been suggested that self-efficacy may be developmentally influenced (Schunk & Pajares, 2002). This may be especially true when considering gender differences when there is a desire to conform to social stereotypes. Social conformity typically presents itself strongly around adolescence (Meece et al., 2006; Wigfield, Eccles & Pintrich, 1996); which suggests why the current results differ from such previous findings. Social desirability in the context of subject specific domains may be less relevant among an

adult learner population, given the nature of ABE programs. Several of the ABE programs aim to support adult learners with skill upgrading which assists in high-school equivalency certification. Most of the learners within this study who were enrolled in ABE programs were attending classes for the purposes of improving their reading, writing and/or mathematics abilities, or a looking to obtain credits for specific trade careers.

Traditional gender role stereotypes, however, may help explain the above findings of differences between males and females in their ratings of reading self-efficacy. From the perspectives of evolutionary and social role theories, men are typically viewed as dominant or as strong providers meanwhile it is more socially acceptable for women to appear emotionally vulnerable (Archer, 1996; Eagly, 1997). As previously noted, Ahl (2006) discussed how reading motivation may be relational in the context of adult education. In this sense, inadequate literacy skills may pose a threat as lower levels of education have been associated with underemployment (Vernon et al., 2007). It is hypothesized that the differences in self-efficacy may be further explained by this argument. Previous learning experiences have shown to influence competencies and ability perceptions **(**Chan, 1994; Wigfield & Eccles, 2000; Wigfield, 1988) however gender roles may dictate self-efficacy differences in how males react compared to females. Males may feel defensive while females may succumb to tendencies toward anxiety and negative emotionality thus explaining the greater sense of competency among males relative to females, regardless of 'subject-domain'.

Race. The current study found that individuals who identified as Caucasian showed significantly lower scores of reading value and interest/enjoyment and greater

scores of self-efficacy compared to other racial groups. Graham (1994) found that African American students expressed positive self-perceptions of their ability regardless of experiences with failure. Furthermore, Usher & Pajares (2006) investigated different influences on self-efficacy and found that social persuasions were more predictive for African American students relative to Caucasian students. However, overall research investigating differences in achievement motivation across races is scarce (Usher & Pajares, 2006), thus this is a much-needed area for future research. Such studies could assist in better understanding characteristics of an adult learner population.

Results from establishing ability groupings early on indicated that individuals who identified as Caucasian were more likely to be classified as part of the NRD group rather than the RD group. Grouping difference analyses found that similar to the results on race the NRD group also had lower levels of reading value and greater levels of self-efficacy. Thus, rather than racial differences, these findings may suggest that among the adult basic education populations from the GTA and Atlanta areas individuals with reading difficulties are more often of non-Caucasian heritage. Thus, these results may have greater implications for the characteristics of adult learners in literacy basic skills (LBS) classes rather than the motivational characteristics of different racial groups.

Language Status. L1 learners had significantly lower scores of avoidance and greater scores of self-efficacy. As previously discussed, literature on adult literacy programs has found differences in language status across individuals within adult literacy programs (Greenberg et al., 2013). However, more than 75% of the sample identified English as their first language, which may have contributed to minimally significant results. Initial analyses found that L1 and L2 learners were equally likely to be classified

as either part of the RD or NRD ability grouping. Similar to the findings on racial group differences in motivation, language status may convey a similar story, this being that L1 learners may be more representative of the NRD grouping, explaining a similar rationale for lower scores of avoidance and greater scores of self-efficacy when compared to L2 learners.

Similarly to race, the motivation characteristics of L1 and L2 learners in the realm of reading difficulties is also understudied (Pierce, Wechsler-Zimring, Noam, Wolf & Katzir, 2013) especially among an adult population. Literature comparisons between L1 and English as a foreign language (EFL) or L2 learners at the elementary level have demonstrated differences in reading skill, however differences in motivation are unclear (Lin, Wong & McBride-Chang, 2012; Pierce et al., 2013). As previously discussed, an ongoing issue within the realm of motivation research is measurement accuracy and consistency. One clear gap among motivation measures, including those used within the present study, is that they do not specify whether individuals rate their responses in regards to the English language. For example, questionnaires simply ask, 'do you like reading?' and while an L2 learner may enjoy reading texts written in their first language, they may feel differently, due to reading ability, for English language texts. However, regardless of this limitation, what is then being assessed is the general motivation to engage with texts regardless of cultural background, language status, gender and so on.

Overall, across sex, race and language status there were small to no significant differences in reading motivation subtypes. Such findings may suggest that reading motivation is more driven by past experiences with reading rather than by individual characteristics such as those mentioned above.

Motivation and Reading Achievement: Research Questions Two and Three

The second and third research questions sought to explore both performance factor and learning factor components of the Big-Two-Factor Theory (Marsh et al., 2003) as predictors of reading value. Both age and reading ability were investigated as moderators for both research questions. The second research question focused on the nature of a performance motivation construct, self-efficacy, and its influence on reading fluency achievement. Accordingly, the third research question examined three constructs of learning motivation and their influence on reading value. All models also considered both ability as well as age as moderators.

Research question two: Self-efficacy and reading fluency skill. Positive relationships between self-efficacy and reading fluency skill were found across all motivation-achievement regression models. Self-efficacy has demonstrated a significant influence in reading achievement outcomes (Diseth, 2011; Guthrie et al., 2007; Proctor et al., 2014; Sadi, 2013) including fluency (Quirk et al., 2009). The beliefs one holds about his/her performance can be powerfully influential to their engagement and performance (Bandura, 1997; Wigfield & Eccles, 2000). Thus, the positive relationships found suggest that if an individual feels a greater sense of competency, achievement would likely follow suit. Similarly low levels of self-efficacy may be predictive of lower achievement.

Furthermore, the motivation reading relationship was moderated by ability for both measures of reading outcome. Ability moderation analyses showed stronger relationships between self-efficacy and achievement for the NRD group compared to the RD group. This has been seen in other studies comparing advanced and struggling readers with engagement motivation and achievement (Lutz Klauda & Guthrie, 2015).

What was more interesting was the presence of moderate to strong relationships between self-efficacy and fluency achievement for typical readers, but virtually no relationship for those with reading difficulties. Thus, if you are a good reader, you feel more confident in your reading ability. Learned helplessness and disability literature has demonstrated differences in self-competencies between typical and struggling readers, showing lower motivation among those with reading difficulties (Lee & Zentall, 2012, Prout et al., 1992, Wolters, et al., 2012). These findings may then support the literature in suggesting that previous experiences are related to constructs such as self-efficacy. Those with a history of reading difficulties tend to demonstrate more negative motivational attributes such as lower self-concept (Chan, 1994; Morgan et al., 2008; Nunez et al., 2005; Valas, 2001). However, this is not always the case, meaning that not all those who struggle with reading experience a sense of helplessness (Kistner et al., 1988; Nunez et al., 2005). This presents some ambiguity when interpreting the results of the motivation achievement relationship across ability populations and may explain the lack of a significant motivation-reading achievement relationship for those with reading difficulties.

Additionally, age was also a significant moderator in the relationship between self-efficacy and reading fluency skill. Stronger relationships were found for the younger population compared to the older population. Self-efficacy is concerned with perceived outcomes which, in turn, may be influenced by previous learning experiences of either success or failure (Diseth, 2011; Gottfried et al., 2007; Marsh et al., 2003; Wigfield & Eccles, 2000). Sensitivity to immediate rewards associated with the dopaminergic mesolimbic system appear to be more active around adolescence compared to adulthood (Ernst, 2014). This may explain results of stronger relationships among young adults

relative to older participants for the self-efficacy models, given the context of response to immediate reading success or failure. However, due to the nature of the recruitment samples these results should be interpreted with caution. The younger age-range of participants was primarily represented by the university sample, which also largely contributed to the NRD ability grouping. Thus, the results may be arguing similar stories. Findings of these moderation analyses will be discussed in greater detail below.

Research question three: Associations between motivation constructs. Positive relationships were found between measures of intrinsic motivation (i.e. intrinsic motivation and interest/enjoyment) and reading value—similar trends were replicated with avoidance and reading value. Academic achievement literature has more often examined the relationships between motivation and achievement outcomes, but less so the relationships between motivation constructs themselves. However, some have developed models examining the mediating roles of motivation constructs (Keskin, 2014; Schaffner et al., 2013). Moderate to strong correlations between measures of learning motivation constructs (i.e. intrinsic motivation, interest/enjoyment, avoidance) and reading value were found. Regression analyses suggested significant results of positive relationships between intrinsic motivation and interest and enjoyment with an individual's value of reading. Similar analyses replicated findings with measures of avoidance behaviours and reading value, demonstrating a negative relationship.

Moderator analyses demonstrated that at the lowest levels of intrinsic motivation and interest and enjoyment for reading, individuals who struggled with reading expressed equal to greater levels of reading value compared to NRD. Furthermore, while those classified as RD showed greater levels of avoidance in comparison to typically developed

adult readers, again results indicated a greater sense of reading value for those with RDs. Thus, a cycle of learned helplessness does not hold true for all individuals who struggle with reading (Kistner et al., 1988). Results suggest that despite a potential history of reading difficulties, adults may continue to express equal to greater levels of reading value compared to the typically achieving reader. Such findings that are contradictory to disability literature that has found lower levels of various motivation constructs for those with reading difficulties (Lee & Zentall, 2012, Prout et al., 1992) may be explained by the focus on an adult population. Ernst's (2014) triadic model explained a greater cognitive impulsivity when anticipating rewards was more active in adolescence for positive contexts. However, in negative contexts reward anticipation was more responsive in adulthood (Ernst, 2014). Important to note is a slight discrepancy between the age ranges within the triadic model and the sample used within this thesis. Though, despite the age range used by Ernst (2014), there has been evidence to suggest cognitive and developmental delays among populations of individuals with reading disabilities (Fletcher, Francis, Shaywitz, Shaywitz & Stuuebing, 1996). This then suggesting that adolescents and young adults with reading difficulties may share similar brain behaviours, perhaps even for motivation and reward centres. Thus, adolescent brain behaviours discussed in this model may also be applicable to young adults with reading difficulties. It was then hypothesized that developmentally adults may be better able to seek long-term rewards despite negative experiences, such as learning difficulties. Qualitative studies by Duncan (2009) and Ahl (2006) suggest that adult reading motivation may stem from external desires such as employment or personal interests such

as reading with children—both which are not immediate rewards due to the need for acquisition of greater skill.

For all but one model (i.e. interest/enjoyment and reading value) age was not a significant moderator. For age moderation the relationship was stronger for younger participants. However, as stated with the previous research question, the younger population was also generally more representative of the NRD grouping due to the nature of a university sample. Overall, ability was the consistent moderator, even after controlling for age across models. Such findings suggest the criticality of experiences with reading relative to maturation or chronological age. The implications of ability and age moderation in the reading motivation relationship are discussed below.

Ability versus age moderation. Findings from the second and third research questions compliment one another as they each sought to better understand reading motivation by testing the influence of both ability and age as moderators. Models investigating motivation and reading achievement relationships were moderated by both ability as well as age for both measures of reading outcome. However, analyses investigating the relationships between motivation constructs were consistently moderated by only ability and not age with the exception of one model.

For typically developing learners achievement will classically increase with age (Bryant & Goswami, 1986). However, in the context of reading for example, those with reading difficulties this relationship looks quite different. Given that two individuals assess at equal reading levels, if one struggled with reading while the other was a typically achieving learner, the one with reading difficulties would most likely be older. Thus, the relationship between age and achievement may not be as strong for a disability

population whose skill has not caught up with their chronological age (Bryant & Goswami, 1986; Mamen, Ferguson & Backman, 1986). This trend was demonstrated across all models of the present study. Ability moderation showed weaker relationships between motivation and achievement as well as among motivation constructs themselves for those who were classified as RD as compared to those classified as NRD.

Furthermore, age significantly moderated motivation and achievement relationships; however this did not hold true for purely motivation-based models. This suggests a critical role of age in achievement models. Across achievement regression analyses age moderation showed stronger relationships between self-efficacy and reading skill among younger participants. As stated before, the nature of this sample must be considered. The younger population was more representative of the NRD population due to the university sample. However, even after controlling for reading ability age was still a significant moderator in both achievement models. Thus, what may be evident here is the presence of a reading skill delay or deficit pattern (Bryant & Goswami, 1986) which may not be as present at early stages. Stated earlier was the *Matthew Effect* that illustrates a growing gap between potential development (i.e. age) and reading skill (Stanovich, 1986). There is an ongoing developmental continuum for skill that should naturally follow with age. With greater experiences and cognitive maturation an individual's skill should increase similarly along the same pathway (Bryant & Goswami, 1986; Stanovich, 1986). However, for individuals with a lower skill threshold, there may be a delay (Bryant & Goswami, 1986; Maman, Ferguson & Backman, 1986). Such literature supports the findings of moderate to strong positive relationships among younger participants yet, with increasing delay/deficit, little to no relationships at the older age

range. As ability and achievement grow further apart this relationship should naturally grow weaker.

Post-Hoc Correlational Analyses

To further investigate the findings of age and ability moderation Pearson r correlations were used to evaluate significant differences in associations between both age and ability with motivation variables. Findings demonstrated significant differences between age and reading skill correlations across all motivation constructs. Age was positively correlated with avoidance, reading value, intrinsic motivation and interest/enjoyment, while negatively correlated with self-efficacy. Meanwhile, reading skill demonstrated opposite trends with significant negative correlations with intrinsic motivation, interest/enjoyment, avoidance and reading value, and a positive correlation with self-efficacy.

These findings may again be explained by the nature of the sample. For typical readers greater skill will follow a developmental pathway due to both cognitive maturation as well as experience with texts (Bryant & Goswami, 1986). This demonstrated a positive relationship between age and reading skill. Furthermore, growth in reading skill has demonstrated predictive power in relation to motivation (Morgan & Fuchs, 2007; Schiefele et al., 2012). Historically, motivation research has argued that when one encounters positive experiences, such as achievement gains, they become more likely to continue or increase their level of engagement (Bandura, 1961; Thorndike, 1911). This builds the case for a positive relationship between age and reading skill, then in turn motivation. However, the exception to this trend is found in disability research. Previous research has found that those within the lower threshold of a reading skill

spectrum tend to express lower levels of motivation to engage with texts, relative to typically developing learners (Lee & Zentall, 2012; Prout et al., 1992; Wolters, et al., 2012). Despite maturation, individuals with a history of learning difficulties may exhibit low levels of motivation due to previous negative experiences (Chan, 1994; Morgan et al., 2008). Such situations could then explain the nature of the negative relationship when skill, and associated achievement motivation, do not follow along the same developmental pathway.

Accordingly, self-efficacy was negatively associated with age, while positively associated with ability. It is hypothesized that this contrast may also be due to the nature of the sample, however, specifically in relation to the method of recruitment. While there was an overlap in both age as well as reading scores the older half of the sample was more representative of the RD ability grouping. Furthermore, younger participants were generally from the university recruitment group, who in turn typically had greater reading scores. Self-efficacy has demonstrated positive relationships with reading skill in previous research (Diseth, 2011; Guthrie et al., 2007; Proctor et al., 2014; Sadi, 2013). Thus, it would be expected that for the typical learner especially, age would be positively correlated with self-efficacy as skill increases with maturation and experience (Bryan & Goswami, 1986). Thus, it is hypothesized that while significant differences were found between age and ability correlations, both sets of correlations may argue the same result within the context of this study due to sampling. After controlling for age and ability across models, ability was the consistent moderator, thus both sets of correlations may support previous results arguing for the importance of reading ability in the context of reading motivation.

Limitations and Suggestions for Future Research

Sampling. Methodology regarding sampling poses the main limitation to the current study, however several steps were taken to control for any potential bias to results that could have been influenced by the nature of the recruitment samples. As previously stated, this study integrated and extended the work of a larger study. The first recruitment sample was drawn solely from the larger study, which included participants with a wide range in personal learning histories. The larger study recruited individuals in adult education programs whose reading skill fell within a range from grade three to grade eight. Comparatively, the second recruitment sample was drawn from a university population, although those included in the study were representative of a lower achievement level relative to a typical post-secondary population.

Due to an overlap between the two samples in both age as well as reading skill the two recruitment groups were combined for a whole group analysis rather than left as two samples for comparative investigations (see Table 2). During both univariate and multivariate assumptions were met. Visual examination via histogram and probability plots revealed some concentration of participants within the 20-age range, however this variable still fell within normal limits for both skewness and kurtosis satisfying assumptions of normality. Overall, the rationale for combining the two samples was the accessibility of a greater range for both age and ability. This wider spread of data allowed investigations of influencing roles for both skill and maturation in relation to reading motivation. However, discontinuous data may pose issues with interpretation, but to help control for potential biases both age and ability were used as covariates among all regression models. Furthermore, all variables, including age and reading skill, met earlier

assumptions of univariate and multivariate analyses including normality, falling within normal limits for both skewness and kurtosis.

Longitudinal studies could provide greater insight into the development of motivation constructs over time. With a dominant presence of youth populations among reading remediation literature (Greenberg et al., 2011; Nanda et al., 2010) it is furthermore recommended that future studies target adult struggling readers. Cross sectional studies may also provide meaningful insight in order to cover a larger age range spanning from elementary school years to adulthood. Studies covered over a series of ages could help gain a better understanding of the development of achievement motivation. Finally, the present study used a standard score cut off to establish ability groupings, however studies using a reading level match design (Bryant & Goswami, 1986; Mamen et al., 1986) could provide further validation of the nature of reading motivation relationships across ability populations. Each of the above recommendations for sampling in future studies could provide greater overall clarity to the relations between reading achievement and motivation constructs across a range of developmental spans.

Self-report measures. Another possible limitation for the current study is the use of self-report measures. Self-report and questionnaire-based methods are heavily used for assessing motivational constructs (Da Costa & Remedios, 2012; Fulmer & Frijters, 2009). Questionnaires often involve statements that conceptualize different constructs of motivation which individuals then rate with Likert-type scales depending on their response or how true a statement is for them (Da Costa & Remedios, 2012). With any form of measurement it is difficult to ensure whether or not participants' responses align

with the objectives of a given study and whether or not they can be further attributed beyond a single condition. This makes it critical to clearly operationalize the constructs of motivation across measurement tools so that they are easily interpretable for both researchers as well as respondents, ensuring both reliability and validity (Da Costa & Remedios, 2012). While questionnaires provide an efficient way to collect a large amount of data with consistency in responses, they may be missing some critical components of motivation. There is research to validate the use of self-report measures within other fields of study (Murray & Perry, 1997; White, 1991); however this measurement in the realm of reading motivation is still unclear. More recently, Schutte and Malouff (2007) conducted a study on the development of an adult reading motivation scale which demonstrated reasonable results for internal consistency. However, the study of the validity and reliability of self-report measures of reading motivation among individuals with reading difficulties still needs great attention.

Interviews have been proposed as an alternative measurement tool as they allow a more open-ended avenue for participants to use their own words to explain their thoughts and emotions. Motivation encompasses components of complex personal perspectives, feelings and experiences that may not be captured with standardized questionnaires. Research with interviews has found that motivation statements are embedded in participant responses (Da Costa & Remedios, 2012; Dowson & McInerney, 2003). However, bias may play a role in the interpretation of interviews. Furthermore, interviews lend more room for participants to behave in a way they feel is more desirable to the researcher, rather than being truthful to themselves (Bem, 1972; Da Costa & Remedios, 2012) which may also hold true for other forms of self-report measures (for an in-depth

review on self-report measures and alternative approaches to the measurement of motivation see Fulmer & Frijters, 2009).

More research is needed to improve both the measurement of and the ability to define constructs of motivation. With motivation research growing, there is the need to continually update current assessment tools that align with recent findings and knowledge of constructs. Additionally, the added limitation of the availability of only a minimal number of measures that are geared towards the adult learner (Nanda et al., 2010) only further stresses the need for further exploration into motivation measurement that is also developmentally appropriate. Therefore, greater research in the realm of motivation should also aim to support improvement in measurement consistency, including the operationalizing of constructs.

Implications for Research and Practice

Achievement motivation has a growing presence among literacy research, however there are many areas that are still understudied in addition to adult struggling reader populations. The ambiguity of motivational differences across sex, language status and race poses an issue for understanding individual influences on reading motivation beyond age and skill. Findings from this thesis suggest that there are significant differences across many individual factors such as sex, race and language status; however more studies are needed to understand the characteristics of adult learners. While the influence of these demographics factors have been investigated in various learning domains (Meece, 2006) their role in adult reading motivation is scarce (Greenberg et al., 2011).

With most reading literature targeted towards child and adolescent populations (Calhoon et al., 2013; Greenberg et al., 2011; Nanda et al., 2010), there is much room, and necessity, for adult-based research. Nanda et al. (2010) found difficulty in applying child-based models in literacy development to adult struggling readers. Accordingly, this thesis found differences in how not only ability but also age influenced reading motivation relationships. Findings suggesting the presence of stronger motivational relationships among younger ages and greater reading skill levels poses interest in investigating the continuum of reading motivation into adulthood. For individuals who continue to experience reading difficulties past adolescence concepts such as the *Matthew Effect* may pose greater threats to cognitive and emotional development as their ability and age gap widen (Stanovich, 1986). Investigating ability and age comparisons over a larger developmental span could provide greater awareness of reading motivation patterns over time. This could in turn inform current and future remediation programs that are better suited to individuals who experience ongoing reading difficulties.

Additionally, the findings of weak correlations for a RD grouping suggest the importance of incorporating motivational components in remediation programs for struggling readers. Motivational components in literacy interventions are becoming more present as there is a desire to increase reading engagement and promote reading growth (Quirk & Schwanenflugel, 2004). Self-efficacy findings suggest that good readers feel more confident in their reading abilities compared to those with reading difficulties. Reading instruction that utilizes reciprocal teaching models, combined with mastery-practice elements and developmentally-scaffolded content, such as the Empower reading program (Lovett, Lacerenza & Borden, 2000; Lovett, Lacerenza, Steinbach & De Palma,

2014), are instructional techniques that could assist in enriching reading motivation. Reading programs should not only assist learners with attaining success but also in identifying their skill growth and relating it to their own capabilities. However, the final research question identified that, despite difficulties, those who struggled with reading were still intrinsically motivated and valued reading equally or even more than typical readers. As previously discussed, reading motivation may move beyond text engagement for the adult learner (Ahl, 2006; Duncan, 2009). This suggests the importance of more than experiences of literacy success within remediation for an adult. Reading programs should be individually centered in order to promote intrinsic motivation and persistence. Utilizing the resilient sense of reading value of adult literacy learners when developing reading programs may promote a heightened sense of engagement. Reading programs for an adult population should build on personal histories and goals, such as employment or reading with children. Establishing connections between those personal needs, interests, and goals and adult literacy curriculum may further promote reading motivation and a drive for skill development for this older diverse population.

Conclusion

Continuously reiterated is the position that adult-based reading research is scarce and, as such, child-based models are often used to inform theory and practice for reading remediation (Calhoon et al., 2013; Greenberg et al., 2011; Nanda et al., 2010). The current study investigated the complexities of adult reading motivation across both ability and age groupings. Literature from multiple disciplines was used throughout this thesis, which supported the position that adult motivation is multifaceted, and requires greater investigation. The major findings of this thesis were significant differences in age and

ability correlations. Furthermore, both ability and age significantly moderated motivation achievement models as well as the relationships between motivation constructs. Such findings illustrate the importance of incorporating motivational elements in reading interventions that support the interests and engagement of struggling readers. Differences between age and ability relationships argue for the consideration of the combined influence of maturation and personal experiences in reading remediation. Overall, the findings support a push for greater adult based research to support developmentally appropriate programs suited to the needs and motivation of adult learners. Such programs are needed to better assist adults with longstanding histories of reading difficulties. It is hoped that adult-based reading programs that consider motivation will not only support reading skill growth, but beyond to also help individuals reach personal achievements and aspirations influenced by reading.

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Appendix A: Reading Ability and Age Moderation Scatterplots

Figure A.1. Interaction between self-efficacy and reading ability on reading achievement (TOSWRF); controlling for sex, race, language status, and age.

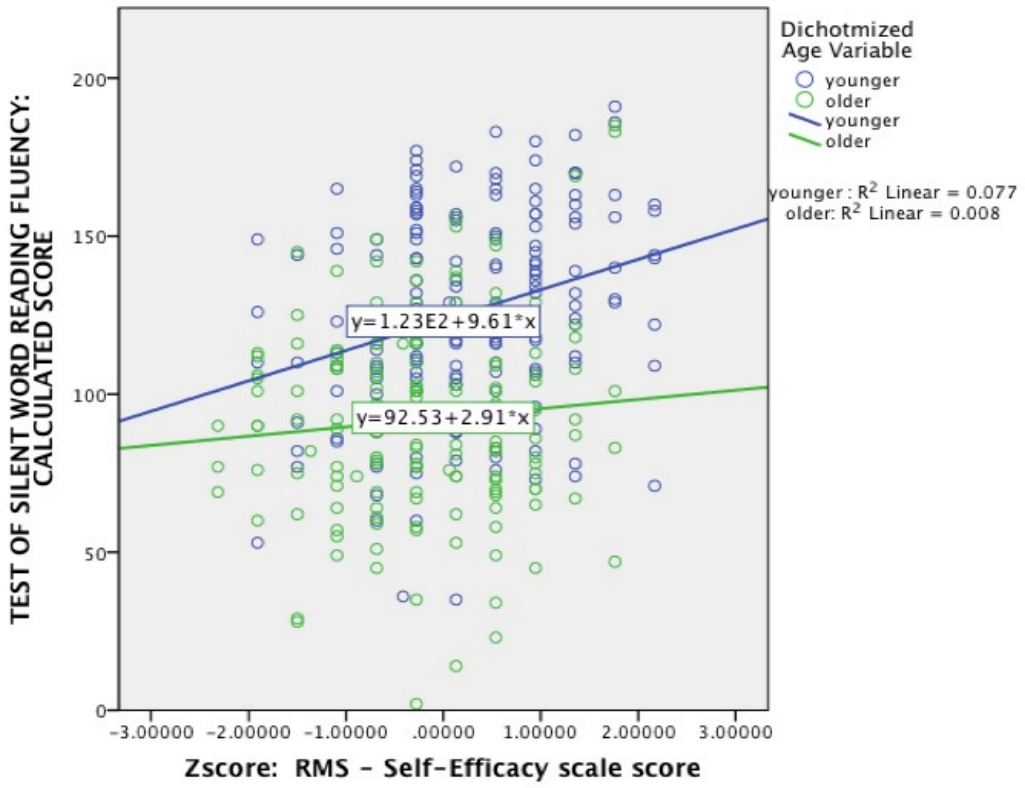

Figure A.2. Interaction between self-efficacy and age on reading achievement (TOSWRF), controlling for sex, race, language status, and ability.

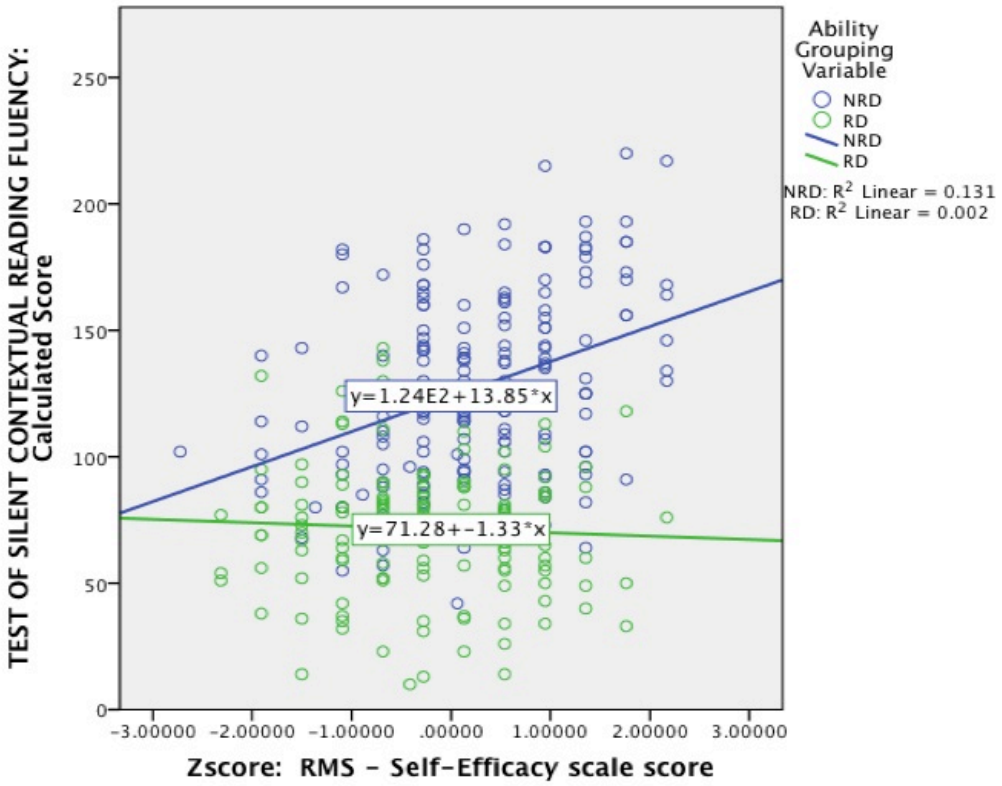

Figure A.3. Interaction between self-efficacy and ability on reading achievement (TOSCRF), controlling for sex, race, language status, and age.

Figure A.4. Interaction between self-efficacy and age on reading achievement (TOSCRF), controlling for sex, race, language status, and ability.

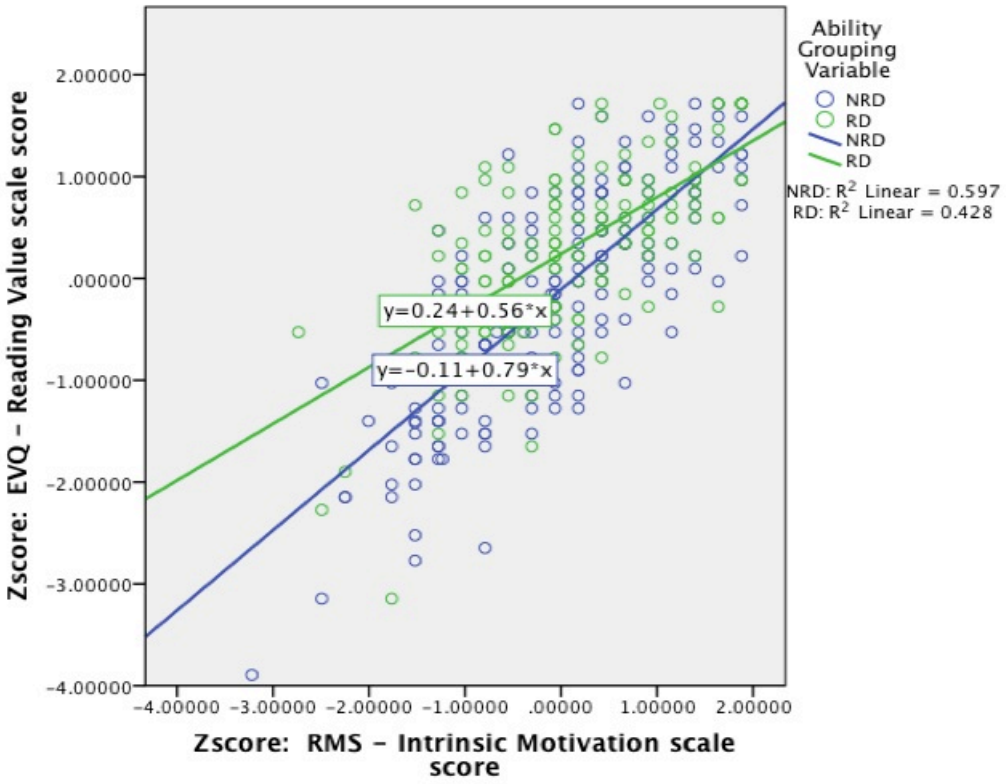

Figure A.5. Interaction between intrinsic motivation and ability on reading value, controlling for sex, race, language status, and age.

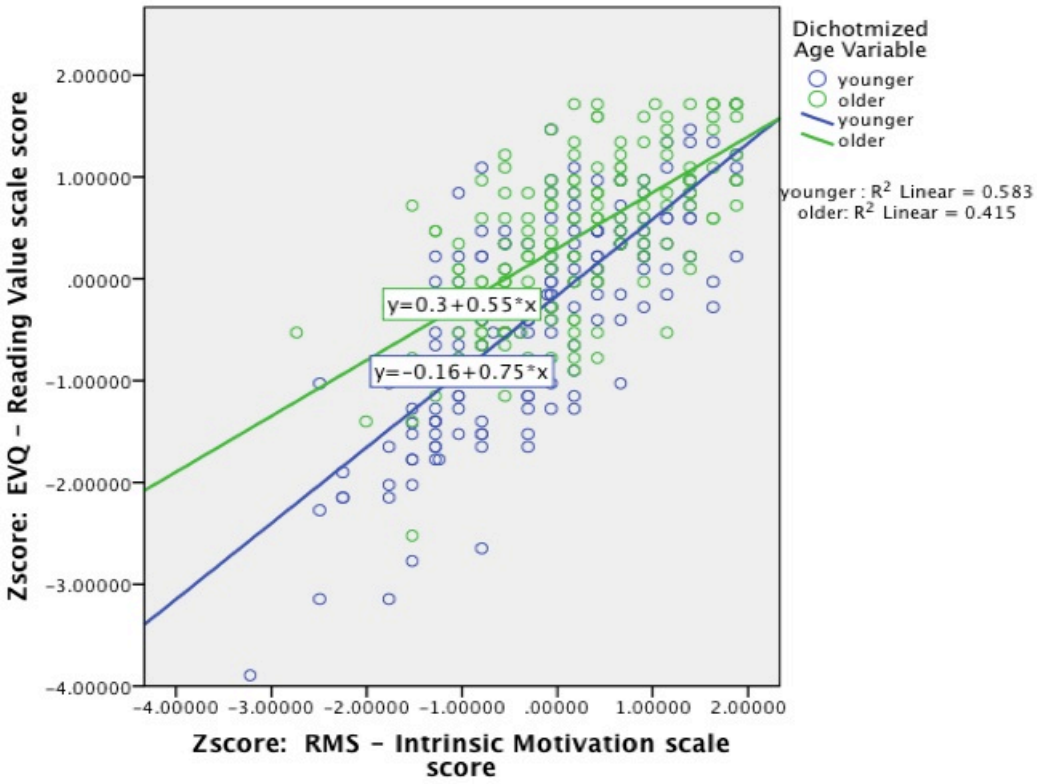

Figure A.6. Interaction between intrinsic motivation and age on reading value, controlling for sex, race, language status, and ability.

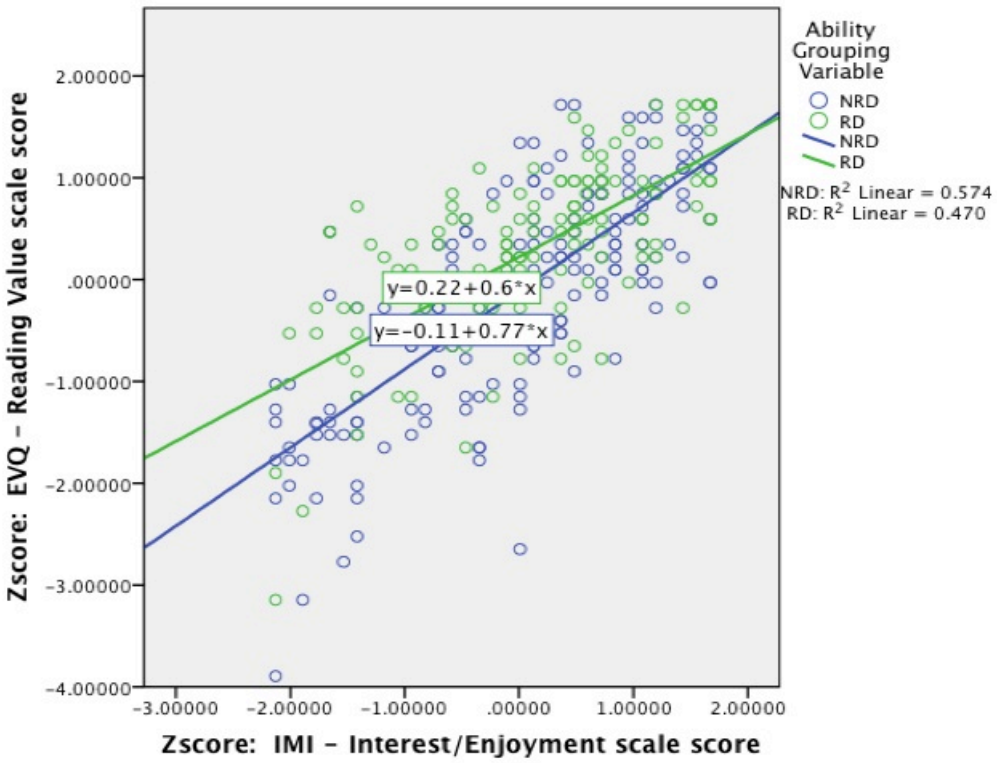

Figure A.7. Interaction between interest/enjoyment and ability on reading value, controlling for sex, race, language status, and age.

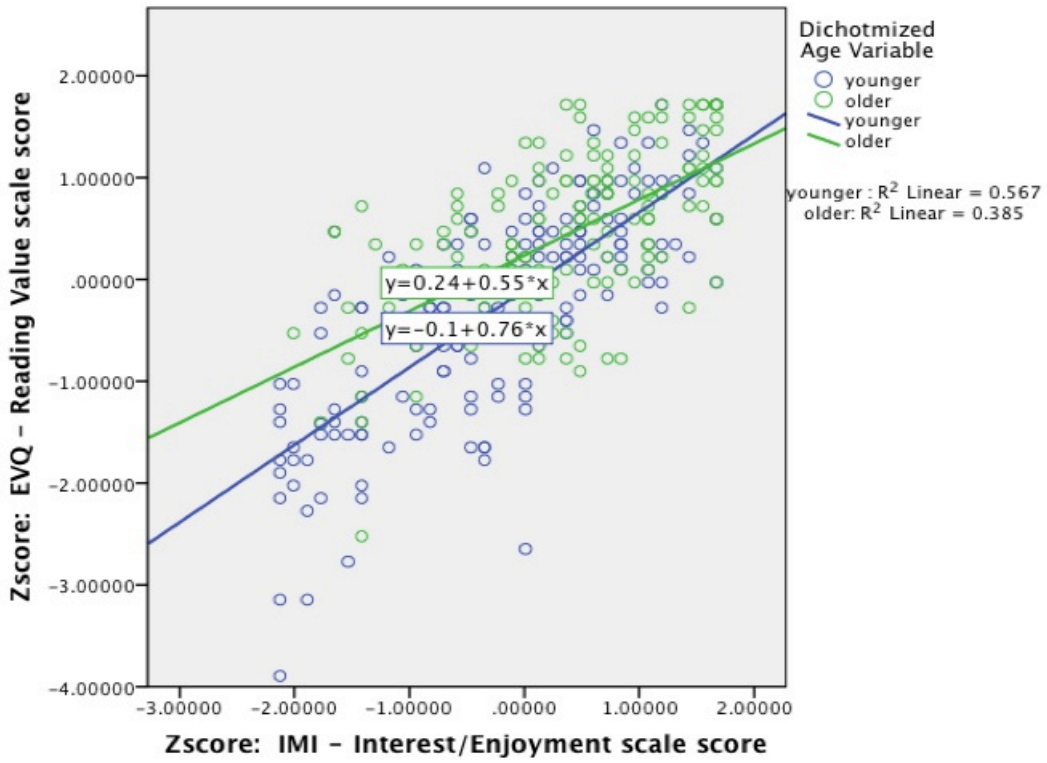

Figure A.8. Interaction between interest/enjoyment and age on reading value, controlling for sex, race, language status, and ability.

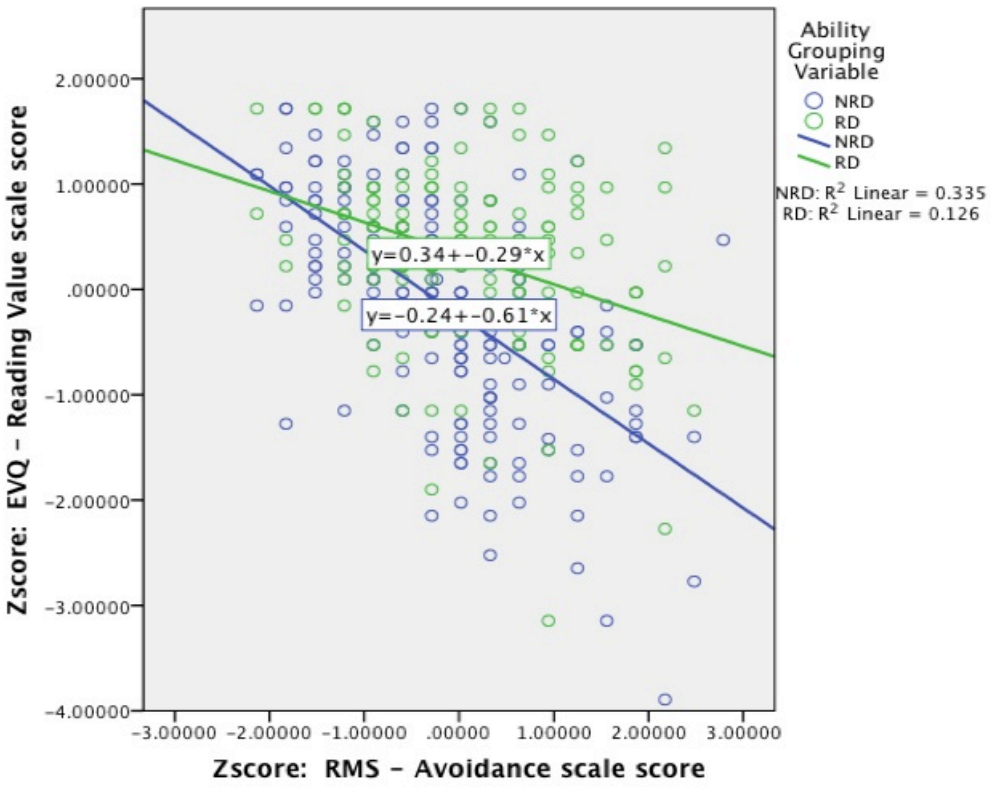

Figure A.9. Interaction between avoidance and ability on reading value, controlling for sex, race, language status, and age.

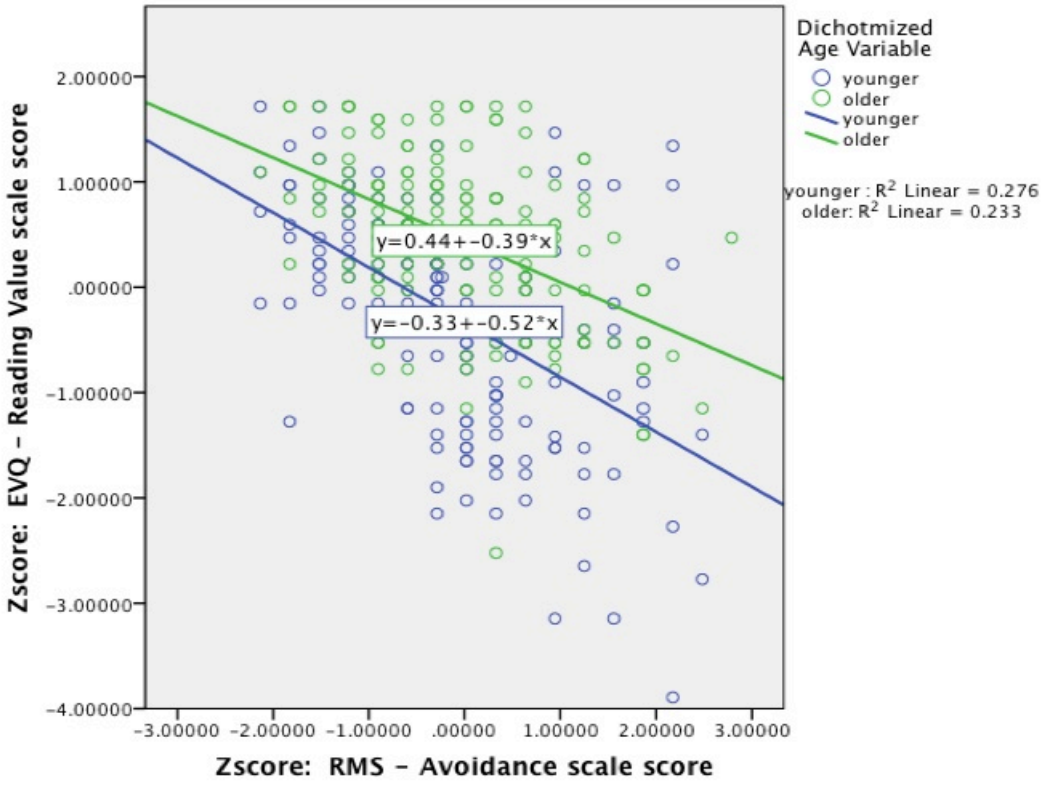

Figure A.10. Interaction between avoidance and age on reading value, controlling for sex, race, language status, and ability.

Appendix B: Intrinsic Motivation Questionnaire

Response Scale: Not at all true of me, A little true of me, Somewhat true of me, Very true of me, Completely true of me

I am going to read some sentences about reading. If there are words or ideas you need more explanation for, please let me know. Please tell me how true each statement is for you. There are no right or wrong answers, we just want to learn about your experiences with reading.

		Not at all true of me 1	A little true of me 2	Somewhat true of me 3	Very true of me 4	Completely true of me 5
1.	I like reading.	○	○	○	○	○
2.	I think reading is enjoyable.	○	○	○	○	○
3.	I put a lot of effort into reading.	○	○	○	○	○
4.	Even when something is hard to read, I stick with it.	○	○	○	○	○
5.	I feel nervous when I read.	○	○	○	○	○
6.	I think I read well.	○	○	○	○	○
7.	When I read, I think about how much I enjoy it.	○	○	○	○	○
8.	I feel good about how well I can read.	○	○	○	○	○
9.	Reading is an activity that I do well.	○	○	○	○	○
10.	When I choose something to read, I can read it easily.	○	○	○	○	○
11.	When I start reading something, I try to finish it.	○	○	○	○	○
12.	It is important for me to do well at reading.	○	○	○	○	○
13.	If I could choose what to do right now, I would read something.	○	○	○	○	○
14.	After reading for a while, I feel like a good reader.	○	○	○	○	○
15.	I put energy into reading.	○	○	○	○	○
16.	I am relaxed when I read.	○	○	○	○	○
17.	I like to read challenging things.	○	○	○	○	○
18.	I would describe reading as interesting.	○	○	○	○	○
19.	Reading is fun to do.	○	○	○	○	○

		Not at all true of me 1	A little true of me 2	Somewhat true of me 3	Very true of me 4	Completely true of me 5
20.	Overall, I enjoy reading.	○	○	○	○	○
21.	I am a good reader.	○	○	○	○	○
22.	I feel very tense while reading.	○	○	○	○	○
23.	I do my best to read well.	○	○	○	○	○
24.	I am anxious while reading.	○	○	○	○	○
25.	I think I am good at reading.	○	○	○	○	○
26.	I am skilled at reading.	○	○	○	○	○
27.	I try my best when I read something.	○	○	○	○	○
28.	I feel pressure when I have to read.	○	○	○	○	○
29.	I read for fun.	○	○	○	○	○

Appendix C: Expectancy Value Questionnaire

Response Scale: Changes per question, with 7 response options in total. The Response Scale column gives the endpoint anchors for the scale, but there should be 5 additional options available between these (with no verbal labels).

Script: I am going to read some questions about reading. If there are words or ideas you need more explanation for, please let me know. There are no right or wrong answers, we would just like to know what reading is for you. Each question has two responses that represent the most and least for that question, please pick where you are between 1 and 7.

Item		Response Scale 1 2 3 4 5 6 7
1.	How much do you like reading?	1 = a little, 7 = a lot ○ ○ ○ ○ ○ ○ ○
2.	Compared to other activities how important is it to be good at reading?	1 = not as important as being good in other activities, 7 = a lot more important than being good in other activities ○ ○ ○ ○ ○ ○ ○
3.	If you were to list all students in your reading class from best to worst in reading where would you be?	1 = one of the worst, 7 = the best ○ ○ ○ ○ ○ ○ ○
4.	How good would you be at learning something new in reading?	1 = not very good, 7 = very good ○ ○ ○ ○ ○ ○ ○
5.	How upset would you be if you couldn't read something that you had to?	1 = very upset, 7 = not at all upset ○ ○ ○ ○ ○ ○ ○
6.	Compared to other subjects, how good are you at reading?	1 = not as good as other subjects, 7 = a lot better than other subjects ○ ○ ○ ○ ○ ○ ○
7.	Compared to other things you could learn, how useful is reading?	1 = not as useful as what I learn in other activities 7 = a lot more useful than what I learn in other activities ○ ○ ○ ○ ○ ○ ○
8.	How good do you think you would be in a job requiring a lot of reading?	1 = not at all good, 7 = very good ○ ○ ○ ○ ○ ○ ○
9.	Compared to other things you could learn, how much do you like reading?	1 = not as much as other activities, 7 = a lot ○ ○ ○ ○ ○ ○ ○
10.	How good at reading are you?	1 = not at all good , 7 = very good ○ ○ ○ ○ ○ ○ ○

Item		Response Scale 1 2 3 4 5 6 7
11.	How often do you wish you were doing something else when you are reading?	1 = never, 7 = almost every day ○ ○ ○ ○ ○ ○ ○
12.	How much do you expect to improve in your reading this year?	1 = not a lot, 7 = a lot ○ ○ ○ ○ ○ ○ ○
13.	For me being good in reading is...	1 = not at all important, 7 = very important ○ ○ ○ ○ ○ ○ ○
14.	I find working on reading tasks...	1 = very boring, 7 = very interesting ○ ○ ○ ○ ○ ○ ○
15.	How useful is learning to read?	1 = not at all useful, 7 = very useful ○ ○ ○ ○ ○ ○ ○

Appendix D: Reading Motivation Scale

Response Scale: Never, Not usually, Usually, Always

Say: **I am going to read some sentences about reading. If there are words or ideas you need more explanation for, please let me know. When the questions ask about things you read, try to think about all of the things that you read, for example books, magazines, newspapers, articles or stories on the Internet. Please let me know whether the statement is never, not usually, usually, or always true for you. There are no right or wrong answers, we just want to learn about your experiences with reading.**

		Never True 1	Not Usually True 2	Usually True 3	Always True 4
1.	Do you enjoy reading in your free time?	○	○	○	○
2.	Do you need extra help in reading?	○	○	○	○
3.	Are you a good reader?	○	○	○	○
4.	Can you figure out hard words when reading?	○	○	○	○
5.	Do you like to read new things?	○	○	○	○
6.	Is it hard for you to understand things that you read?	○	○	○	○
7.	Do you guess a lot when reading so you can finish quickly?	○	○	○	○
8.	Is reading boring to you?	○	○	○	○
9.	Do you read easier things so you don't have to work as much?	○	○	○	○
10.	Can you sound out long words?	○	○	○	○
11.	Do you make lots of mistakes when you read?	○	○	○	○
12.	Do you learn more from reading than other people you know?	○	○	○	○
13.	Are the things people ask you to read too difficult?	○	○	○	○
14.	How often do you try to find something good to read?	○	○	○	○
15.	Do you enjoy the challenge of reading?	○	○	○	○
16.	Do you feel others are smarter than you in reading?	○	○	○	○
17.	How often do you think, "I don't want to read this?"	○	○	○	○
18.	Can you recognize words easily when you read?	○	○	○	○
19.	Do you think you will read things well next year?	○	○	○	○

		Never True 1	Not Usually True 2	Usually True 3	Always True 4
20.	Do you enjoy reading interesting things, even if they are hard?	○	○	○	○
21.	Is reading to other people a challenge for you?	○	○	○	○
22.	Do you enjoy reading for long periods of time?	○	○	○	○
23.	Do you try to get out of reading things?	○	○	○	○
24.	Are you good at remembering words?	○	○	○	○
25.	Do you wish you didn't have to read?	○	○	○	○
26.	Do you read as little as possible?	○	○	○	○
27.	Do you like it when what you read makes you think?	○	○	○	○
28.	Do hard words stop you from reading?	○	○	○	○